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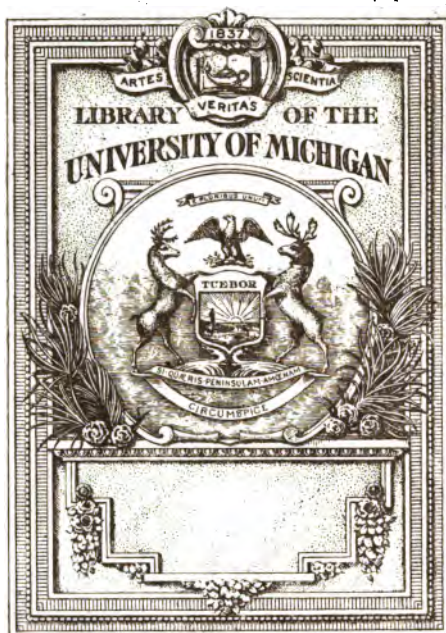
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TENTH BIENNIAL REPORT

OF THE

NORTH CAROLINA



BOARD OF HEALTH

1903—1904

RALEIGH

E. M. UZZELL & Co., STATE PRINTERS AND BINDERS

1905

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TENTH BIENNIAL REPORT

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North Carolina Board of Health

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1903-1904



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Cumberland	Dr. A. S. Rose.
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Davidson	Dr. Joel Hill.
Davie	Dr. M. D. Kimbrough.
Duplin	Dr. A. J. Jones.
Durham	Dr. N. M. Johnson.
Edgecombe	Dr. W. J. Thigpen.
Forsyth	Dr. W. O. Spencer.
Franklin	Dr. R. F. Yarborough.
Gaston	Dr. H. F. Glenn.
Gates	Dr. W. O. P. Lee.
Graham	Dr. V. J. Brown.
Granville	Dr. S. D. Booth.
Greene	Dr. W. B. Murphy, Jr.
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Haywood	Dr. J. F. Abel.
Henderson	Dr. J. G. Waldrop.
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Hyde	Dr. E. H. Jones.
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Lincoln	Dr. John W. Saine.
McDowell	Dr. B. L. Ashworth.
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Watauga	Dr. H. McD. Little.
Wayne	Dr Williams Spicer.
Wilkes	Dr. W. P. Horton.
Wilson	Dr. W. S. Anderson.
Yadkin	Dr. T. R. Harding.
Yancey	Dr. J. L. Ray.

LETTER OF TRANSMISSION.

NORTH CAROLINA BOARD OF HEALTH,

OFFICE OF THE SECRETARY,

RALEIGH, January 2, 1903.

His Excellency, CHARLES B. AYCOCK,

Governor of North Carolina.

SIR:—In accordance with section 3, chapter 214, Laws of 1893, I have the honor to present for transmission to the General Assembly this, the Tenth Biennial Report of the North Carolina Board of Health.

With great respect,

RICHARD H. LEWIS, M. D.,

Secretary and Treasurer.

TENTH BIENNIAL REPORT
OF THE
NORTH CAROLINA BOARD OF HEALTH
1903-1904

Two years ago, in the opinion of the health authorities of many of the States, our country was threatened with an epidemic of bubonic plague. In spite of the positive assertion on the part of several of the leading bacteriologists of the United States of its presence in San Francisco, the fact was persistently denied by the Governor of California and the Board of Health of that State. In consequence, believing that the proper precautions were not being taken to prevent its spread to other sections, a sufficient number of States, including our own, requested a conference with the Surgeon General of the United States Public Health and Marine Hospital Service under the law governing that bureau. This was granted, and the meeting was held on January 19, 1903, the Secretary of our Board representing North Carolina. As the result of some very plain talk and the adoption of strong resolutions on the subject, the unfavorable conditions in San Francisco were remedied and the menace averted.

During the past biennial period our State has been spared any unusual outbreak of disease, with the exception of the occurrence of typhoid fever in the Baptist Orphanage at Thomasville, in which there were sixty-seven cases, with two deaths, and of smallpox in many localities.

While our work of educating the people in the principles of Hygiene in general, and more particularly as to the best methods of avoiding the infectious and therefore preventable diseases, has not been relaxed, special efforts have been

made in regard to *Uncinariasis*, or hook-worm disease, and tuberculosis.

The work in the biological laboratory has grown in amount and consequently in value to the people of the State. The demands upon it at present are more than can be met with the facilities available.

In the body of the report the subjects alluded to above will be found considered at length.

MEETINGS OF THE BOARD.

MINUTES OF THE ANNUAL MEETING AT HOT SPRINGS.

HOT SPRINGS, N. C., June 2, 1903.

Annual meeting of the Board: Present: Drs. Thomas, Battle, Ivey, Duffy, Nicholson and R. H. Lewis.

The minutes of the last meeting were read and approved. Dr. J. N. McCormack, the genial Secretary of the Kentucky Board of Health, was invited to participate in the meeting.

The Secretary made a report of work done. The Treasurer made his report. Drs. Duffy and Nicholson were appointed a committee to audit the same. They reported it to be correct.

There was a special discussion of vaccination and the best virus.

On motion the Board adjourned to meet next day at 12 M. in conjoint session with the State Medical Society.

RICHARD H. LEWIS,
Secretary.

CONJOINT SESSION
OF THE
STATE MEDICAL SOCIETY WITH STATE BOARD OF HEALTH,

HOT SPRINGS, N. C., JUNE 3, 1903.

Dr. George G. Thomas, President, in the chair.

CHAIRMAN: I do not desire to make any remarks in opening this meeting, except to renew again the thanks which were offered to Dr. Stiles for his great help to us by presenting the different phases under which that serious disease, hook-worm, can be known and cared for. I think his visit is an epoch in the history of North Carolina and of the South, and I think he deserves from this meeting, especially from the Board of Health, assuredly, very decided gratitude, and he may be assured of our continued esteem.

DR. KNOX: I desire, as President of the Medical Society of North Carolina, to most heartily second the motion, and regret not making the same remarks last evening, but owing to the Doctor's leaving so soon, rather confused matters.

CHAIRMAN: The report of the Secretary is now in order. The report is read by Dr. R. H. Lewis, Secretary.

NORTH CAROLINA BOARD OF HEALTH, REPORT OF SECRETARY, JUNE 1, 1902, TO JUNE 1, 1903.

A full statement in detail of the work of the Board from the time of our last meeting, consisting chiefly, in addition to the routine work of the Secretary's office, of inspections of the State institutions and of the public water supplies, will be found in the Biennial Report for 1901 to 1902. This report, notwithstanding the fact that the copy for the same was furnished the State Printer at the usual time, is still in his hands, and I am therefore unable, much to my disappointment, to distribute it at this meeting to those interested. It will, however, be mailed to any one asking for it as soon as it comes from the press.

Since the beginning of the new biennial period, on January 1, 1903, our most important work has been in the line of legislation.

Believing that incompetent physicians constitute one of the greatest menaces to the public health, I felt it to be my duty to try to obtain from the General Assembly, if possible, such an amendment to our medical license laws as would cure the defect existing therein as declared by our Supreme Court in its recent decision in *State v. McKnight*. We gained much, but not all we asked.

The purity of our drinking waters being one of the prime essentials of health, legislation for the better protection of our municipal water supplies was sought and obtained. Inasmuch as a full statement in regard to these two matters, together with copies of the acts, has already been printed in the monthly BULLETIN, it is unnecessary to repeat them in this report.

I also prepared a bill appropriating twelve hundred dollars to aid in our bacteriological work, and succeeded in getting a favorable report from the Committee on Appropriations of the House. But that was the last of it. It apparently fell immediately to sleep and never waked. Besides the above, I likewise assisted, at their request, the representatives of the State Nurses' Association in preparing a bill for the registration of trained nurses, and in securing its passage. The importance of thorough training on the part of the nurses is second only to that rightly demanded of the physicians, and this legislation is clearly in the interest of the public health. While not interfering with the right of any one to nurse the sick, the act, after January 1, 1904, permits the registration and the use of the title R. N. (registered nurse) only to those obtaining a license from the State Board of Examiners, consisting of two physicians to be elected by the State Medical Society and three trained nurses to be elected by the State Nurses' Association. Hereafter the appearance of the letters R. N. after a nurse's name will be a guarantee of her thorough training, and if our physicians will discriminate in their recommendations in favor of that class they will create a very strong incentive on the part of all trained nurses to enroll themselves in the future among those who will surely be recognized as the best in their calling.

BIOLOGICAL LABORATORY.

Learning that the State Board of Agriculture might be compelled to withdraw their most valuable aid to the cause of health in having made for us biological analyses of suspected drinking waters, sputum, etc., on account of certain extra demands upon their income made by the last Legislature, I secured the concurrence of the State Water-works Association in certain provisions in the Act to Protect Water Supplies, requiring all water companies to have made in our laboratory a monthly analysis of their waters, and pay five dollars for each analysis. If the water companies will comply with the law in this

respect the expense of the laboratory can be shared by us and the people at the same time be more fully protected. Upon the invitation of the Board of Agriculture, I appeared before them on May 30th and explained the situation and our ability under the Act to Protect Water Supplies to assist in paying part of the expense incident to the hygienic work which they have been so generously doing for us free of charge since December, 1899. I proposed, speaking for the Board of Health, to pay one-half of the salary of the biologist and to furnish all new apparatus and reagents that might be required for our special work, the Board of Agriculture to furnish the laboratory with its permanent equipment, attendance, water and gas. At their request, I put the proposition in writing and it was formally accepted by a unanimous vote on their part.

SMALLPOX.

Smallpox, I regret to say, has been much more prevalent during the past year than ever before, and more fatal, confirming our predictions to that effect, in view of the indifference of our local authorities on the subject of vaccination. And unless there is a change in this respect I see no reason to anticipate anything else than a continuing recurrence of smallpox until all the people have either been vaccinated or have had the disease.

During the past year—May 1, 1902, to May 1, 1903—smallpox has occurred in fifty-eight counties, the number of cases being: White, 1,681; colored, 2,595; total, 4,456; with deaths, white, 58; colored, 105; total, 163, the death rate per cent being respectively, 3.12, 4.04, 3.66. For the first time in our experience the death rate from this disease has been higher among the negroes than among the whites, the figures heretofore having been very much in favor of the former. A comparison by years—the first period, however, extending from the occurrence of the first case on January 12, 1898, to May 1, 1899, a little over fifteen months—is given in the following tabular statement:

Year.	Number of Counties.	Number of Cases.			Number of Deaths.		
		White.	Colored.	Total.	White.	Colored.	Total.
1898-1899 -----	38	162	554	716	8	9	17
Death rate, per cent -----					4.93	1.97	2.76
1899-1900 -----	55	731	2,075	2,806	35	30	65
Death rate, per cent -----					4.78	1.44	2.31
1900-1901 -----	54	530	1,415	1,945	15	23	38
Death rate, per cent -----					2.83	1.63	1.95
*1901-1902 -----	55	616	1,196	1,812	21	27	48
Death rate, per cent -----					3.41	2.28	2.59
1902-1903 -----	58	1,861	2,595	4,456	58	105	163
Death rate, per cent -----					3.12	4.04	3.66
Total number of cases Jan. 12, 1898, May 1, 1903 -----		3,900	7,835	11,735			
Total number of deaths -----					137	194	331
Death rate, per cent -----					3.51	2.47	2.82

(*In this year there were in Wilson County, according to conservative estimates, from twelve to fifteen hundred cases of smallpox, as diagnosed by experts sent to the county, which the Superintendent of Health insisted were not variola, and in consequence did not report.)

From the above statement, it appears that there have been reported to the Secretary since the first case 11,735 cases of smallpox with 331 deaths. How many more cases, under the names chicken-pox, Cuban itch, etc., have escaped record, it is, of course, impossible to say. We have good reason to believe that there were certainly over a thousand such cases in one county—Wilson. The only other similar instances were neighborhood outbreaks that were not discovered until numbers had recovered.

When we consider the loss to the State in the 331 deaths, the expense of caring for nearly 12,000 such cases and the indirect loss in trade, the statement is quite impressive. It is likewise lamentable when we realize that it could have been prevented by the vaccination of all the people.

The following is a tabulated statement by counties of smallpox during the past year :

**SMALLPOX IN NORTH CAROLINA, MAY 1, 1902, TO
MAY 1, 1903.**

Counties.	Cases.			Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Alamance	4	1	5			
Anson	3	0	3			
Beaufort	0	1	1			
Buncombe	305	116	421	0	1	1
Burke	73	152	225	2	0	2
Cabarrus	4	13	17	1	0	1
Camden	1	2	3	0	1	1
Caldwell	10	75	85	0	1	1
Carteret	7	10	17	0	1	1
Catawba	10	66	76			
Chatham	9	0	9			
Cleveland	30	20	50	2	0	2
Craven	16	163	179	5	30	35
Cumberland	0	1	1			
Currituck	9	2	11			
Davidson	29	2	31			
Davie	7	3	10			
Durham	4	40	44			
Forsyth	100	275	375	1	3	4
Gaston	75	25	100	1	1	2
Gates		5	5			
Graham	28		28			
Granville	6	72	78		1	1
Guilford	53	70	123	22	2	24
Haywood	28		28	2		2
Henderson	18	49	67			
Iredell	5	37	42			
Johnston	3	1	4			
Jones	9	9	18	1	2	3
Lincoln	75	8	83			
Macon	24		24			
McDowell	100	200	300	1	1	2
Mecklenburg	101	326	427	11	43	54
Montgomery		17	17			
Moore		1	1			
Nash	5	1	6	1		1
New Hanover		2	2			
Northampton	7	4	11			
Onslow	3				2	2
Orange		47	50			
Polk	56	25	81			
Randolph	1	32	33			
Richmond	1	5	6			
Rockingham	54	73	127	5	2	7
Rowan	2	125	127		2	2
Rutherford	79	65	144			
Sampson	1	94	95		1	1
Stanly	11	20	31			
Stokes	40	25	65	1		1
Surry	119	63	182		1	1
Swain	300	*4	304			
Transylvania		4	4			
Union	11	172	183	1		1
Vance		12	12			
Wake	1	3	4			
Wilson	4	3	7			
Yadkin	13	4	17			
Yancey	2		2			
Total (in 58 counties)	1,861	2,595	4,456	58	105	163
Death rate, per cent.				3.12	4.04	3.66

*Indians.

CHAIRMAN: You have heard the report. Are there any remarks to be made thereon? If not, what is your pleasure? I would be glad to hear from any of the members in regard to any difficulties they may meet in the performance of their duties, especially in the management of smallpox.

DR. J. M. MANNING: Six years ago when smallpox made its appearance in the State, I, unfortunately, happened to be the Superintendent of Health of Durham, and the first cases occurred in Durham County. I remember the circumstance of a man who came there from Greenville—ran the blockade from Greenville and came to Durham, his old home. Of course, when the news got out in the city that there was a case of smallpox, there was quite a scare among the citizens. We were totally unprepared to take care of a case of contagious disease. We had no pest-house. The Mayor and myself rode all over the neighborhood and the county to locate a tent, and we were met with shot-guns wherever we proposed putting a tent, but finally the county owned a small strip of land, half a mile from the County Home, and we succeeded in establishing a pest-house in the shape of a tent. With the active co-operation of the city and county authorities, and the management of the different manufactories in Durham, we succeeded in vaccinating a large proportion of the citizens of the town, and that epidemic—I can hardly call it an epidemic—was stopped. We set fire, by kerosene oil, to one of these houses near the Market House, in the central part of town, and we had the water supply to prevent fire extending to other buildings. In that epidemic we only had ten cases. We succeeded in getting the epidemic stopped. Since then they have adopted a different mode of managing cases of smallpox—and a method that I can't very heartily approve. The county and city authorities share conjointly the expense of the smallpox epidemics, and they become alarmed about the amount of it, so the plan—the method now used in Durham—is to send a case of smallpox

to the pest-house and vaccinate the other inhabitants of the house and disinfect them as much as possible, and turn them on the community. Whether that is very effective, I am not prepared to say. Those cases are kept on the quiet and you really do not know what is going on.

Dr. Battle asks Dr. Carl Reynolds to give his experience, who, he says, is rather bashful.

DR. CARL REYNOLDS: Mr. President and gentlemen, I am a little bashful, but, as it has happened, I have had quite a little experience with smallpox in Asheville, N. C., for the past five or six years. I have had three cases of confinement, coming to maturity, and three miscarriages, and have never lost mother or child. In about four or five hundred cases altogether in the last five years I have only had one death, and I doubt seriously if I would have had any at all if the parents had been truthful. The cases were reported—a family of nine. I went immediately to the house of suspects and vaccinated them all. They claimed that every member of the family had been vaccinated. I examined them, they had scars. I revaccinated them. They smuggled under the bed clothes a child about four months of age. Three or four days thereafter this mother broke out with smallpox, and the entire family was sent to the pest-house, and on the next day, on my visit, I found this nursing babe who had never been vaccinated. I vaccinated the child in three places, neither of which was successful; the child developed smallpox and died in ten days. I thoroughly believe that if that child had been vaccinated with the rest of the family it would have been living to-day. My experience with smallpox for the last five years is that I have never seen a case in the pest-house that had been successfully vaccinated, not even a case of varioloid, that had been successfully vaccinated in the last five years. One case I vaccinated five times. Turned him out twice. It was, in my opinion, a fight between the vaccine and the smallpox. He developed

twelve bumps, and was well in about twelve days. Vaccination is the thing, gentlemen, and unless we have the hearty co-operation of all our brother physicians, both in the cities and the counties, we will have with us forever smallpox. We have had quite a struggle in Buncombe with the outside physicians on account of smallpox being mild in form. They say it isn't smallpox, but chickenpox, etc., and consequently do not enter with us in the work of vaccinating the people. But in the city of Asheville—it has been thoroughly vaccinated twice within the last five years—and I venture to say there are not 300 people in the 15,000, unless they have come into the city within the last six months, that were not successfully vaccinated, and for the last eight months I have not received a single case of smallpox that has not come into the city since our last vaccination. There is one thing that I would like to touch upon while I am on my feet. I think I wrote to Dr. Lewis about it. We ought to have a law compelling the common carrier, all railroads, to compel every member of their force to be vaccinated; and until we do have the railroad people vaccinated that come from one place to another, carrying these germs and dropping them down, we will continue to have smallpox. That is very important and essential. Another thing, Mr. President, I would like to give a little estimate of my care of the smallpox, that is, relative to the expense. These gentlemen who are laughing behind me know the reason. I had in my care 227 cases of smallpox, and the expense per capita—they stayed in the house from two to three weeks, one man was in there eight weeks—including their maintenance, food, fuel, fire, guard service, physician's bill, vaccine, formaldehyde, etc.—everything, the sum total per capita per diem was 40-7.10 cents per day. What do you think of that? I think it was very reasonable, but when they began to look around again for a new health officer they accused me of highway robbery—bleeding the city of Ashe-

ville; so I thought I would come down in this society and tell you about it, that you had better be careful when you treat cases of smallpox. Forty and seven-tenths cents was my average cost for the treatment of 227 cases.

CHAIRMAN: Many refuse to submit to vaccination because of the serious arms which have followed the practice, and that in turn seems to have been the result of very bad vaccination. We were told by Dr. McCormack that he himself, and probably a number of others who were interested with him, were considering the return to the use of humanized virus. Lately the Marine Hospital Service has published a bulletin setting forth some examinations made in the different outputs of manufacturers that were manufactured in this country. I would be glad if Dr. Stiles would tell us what he knows of the subject.

DR. STILES: There is one principle that I hold to in life, and that is to not talk too much about that I know little about. This work was done by my colleague, Dr. Rosecrans, and to sum up his results in a very few words, he found when he began the investigations that the vaccine virus was not so free from bacteria as we had a right to expect. He presented a paper on the subject before the Medical Society, giving his results, and that stirred up the manufacturers of the virus to a considerable extent. He made an examination a year later and found that the virus was very much more pure, so that his investigations seem to have had a very good effect upon the manufacturers, and it is certainly hoped on the part of the men interested in that particular investigation that this effect will be lasting. With reference to the relative value of the bovine and human virus I have a decided hesitancy in discussing the subject before men who have had so much more experience in that matter than I have. It is, really, entirely out of my special line of work, and I would not want to say anything to prejudice either the one way or the other. I think that the Board of Health is in a much

better position to speak authoritatively upon the subject than I am.

DR. BUTLER: Mr. President, I came to this meeting at your suggestion yesterday on the train, not with the intention of doing any talking. I came here rather for the pleasure of listening and learning. I do not know that I have anything new to say on the subject that you are not already familiar with. You know that since last year investigations have been going on in regard to the intermissibility of bovine and human tuberculosis, but I do not know if anything has been done that you are not perfectly familiar with, and I would not wish to take up your time discussing it. The tendency is to show that the danger which was once fancied to exist from the consumption of the products of the lower animals is not nearly so great; that there is little danger perhaps, yet I think the result of investigation shows that there is danger, and some of the recent work seems to confirm it.

* * * The tendency of recent research was to prove that there did exist some danger, and while I am chiefly interested myself from a veterinary standpoint, even if there was no possibility of communicating it to man, still I do not think the physician can afford not to take the advice that has been given us, and use all precaution as to communication of bovine tuberculosis to the human family. I certainly think we ought to strictly supervise the products from the dairy.

CHAIRMAN: Any other remarks, gentlemen?

DR. R. H. LEWIS: I would like to offer the following resolution:

Resolved, That the conjoint session of the North Carolina Board of Health and the State Medical Society adopt, in so far as the local conditions will permit, the recommendations of the Chief Statistician of the United States Census Bureau as to collection and registration of vital statistics.

Seconded and adopted.

CHAIRMAN: Any further business before the house?

Some discussion, raised by Dr. Carl Reynolds, as to the one who should furnish certificates to be placed on coffins. Dr. Lewis states that there is no law. It is the general opinion of the members that the undertakers are the ones who should furnish such certificates.

It is moved that the conjoint session of the State Medical Society and State Board of Health adjourn.

Seconded and carried.

MINUTES OF THE ANNUAL MEETING AT RALEIGH.

RALEIGH, N. C., May 24, 1904.

Annual meeting. Present: Drs. Duffy, H. W. Lewis, Ivey, R. H. Lewis and Mr. Ludlow.

In the absence of President Thomas, Dr. Duffy was elected President *pro tem*.

The minutes of the last meeting were read and approved.

The Secretary presented a request from Dr. McCarthy, the Biologist of the Board, for an increase of salary. It was agreed to make, on the part of the Board of Health, an increase equal in amount to any increase made by the Board of Agriculture, not to exceed a total salary of fifteen hundred dollars per annum.

The Secretary stated that it was impossible to do the work of his office without the aid of a stenographer and typewriter, and asked, if it should be thought by the Board to be proper and advisable, for an appropriation of \$20 a month for this purpose. On motion of Dr. Ivey the Secretary was authorized to employ a stenographer for part of her time on the best terms possible, not to exceed \$20 a month.

The following committee of inspection were appointed:
State Institutions at Raleigh—Ivey, Thomas, and Lewis,
R. H.

The University—Thomas and Lewis, R. H.

The Normal and Industrial College and the A. & M. for
the colored—Battle and Lewis, R. H.

The Eastern Hospital for the Insane—Duffy and Nicholson.

The Penitentiary farms—Lewis, H. W., and Ludlow.

The convict camp in Wilkes County—Ivey.

The Orphan Asylums at Oxford—Whitehead and Lewis,
R. H.

On motion of Dr. H. W. Lewis, the engineer of the Board, Mr. Ludlow, was requested to assume the general supervision of the public water supplies of the State, with authority to visit and make personal inspections whenever in his judgment it might be necessary, this to take the place of the biennial inspections heretofore made.

The following delegates to sanitary meetings were appointed:

Annual conference with the Surgeon General of the U. S. Public Health and Marine Hospital Service—Lewis, R. H.

National Conference of State and Provincial Boards of Health—Duffy and Lewis, R. H.

American Public Health Association—Referred to President and Secretary with power to appoint.

It was suggested that an effort be made to give the school children in the State instruction in elementary hygiene, also for the improvement of the sanitation of the public schools. The Secretary stated that this latter had been done in the form of a special issue of the Bulletin on School Hygiene, which had been sent to all the public-school teachers by the State Superintendent of Public Instruction.

The Treasurer submitted his report with vouchers. Drs.

Ivey and H. W. Lewis, appointed a committee to audit the same, reported it correct.

On motion the Board adjourned to meet at 12 M. next day, in conjoint session with the State Medical Society.

RICHARD H. LEWIS,
Secretary.

CONJOINT SESSION
OF THE
MEDICAL SOCIETY OF NORTH CAROLINA
AND THE
NORTH CAROLINA STATE BOARD OF HEALTH,
HELD ON WEDNESDAY, MAY 25, 1904,
AT RALEIGH, N. C.

At this meeting Dr. Francis Duffy of the Board of Health in the unavoidable absence of President Thomas, presided over the conjoint session. Present, the members of the State Board of Health and the general meeting of the Medical Society.

DR. LEWIS: Mr. President and Gentlemen, I wish to express my gratitude for one encouraging feature to-day. It has been the custom for the Medical Society to promptly melt away at the mention of the joint session. It is doubly encouraging to us that this has not been so marked as usual. I see before me a gratifying attendance. The annual report is as follows:

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH, MAY 1, 1903—MAY 1, 1904.

As must always be the case, the work of your Secretary during the past year has been largely of the usual routine character, dealing with the common every-day affairs of sanitation. These, however, are none the less important because they are commonplace, as they practically cover the whole field of hygiene. But we have one entirely new subject as applying to our State of great interest and importance, viz.:

UNCINARIASIS OR HOOKWORM DISEASE.

Inspired by the admirable address of Dr. Charles Wardell Stiles, Zoologist of the United States Public Health and Marine Hospital

Service, at our last meeting at Hot Springs, on the *Uncinaria Americana*, of which he was the discoverer, and its prevalence in our Southern States, I promptly set to work to interest our physicians in the subject. In several issues of the BULLETIN the matter was called to their attention, a summary of Dr. Stiles' official report and other articles being printed, and the medical reader was urged to send specimens of feces from suspected cases to our laboratory for diagnosis. The response to this, I regret to say, has been discouraging, as only thirty-two applications for the examination have been made during the year. This, however, does not represent, by any means, all the work done in relation to the hookworm disease. Dr. W. S. Rankin of Wake Forest, in the early fall, offered to give a month of his time to the Board without charge, other than his actual expenses in making a personal investigation, proposing to visit with his microscope the physicians in a number of our eastern counties and make the diagnosis for them on the spot. Authority was obtained by correspondence with the members of the Board to accept Dr. Rankin's offer. He began his investigation by a trip during Christmas week to Northampton and Edgecombe counties. The results were so meagre and discouraging, as will appear in his report, which he will read, that we agreed that it would not pay to continue the personal work, and the spring tour of three weeks was accordingly abandoned. He has, however, done other work on this line by correspondence and among students of the college, as he will detail to you. The physical signs of uncinariasis are so striking and the diagnosis from the mere general appearance of a victim to it, taken together with his environment, is so easy that I have no doubt the diagnosis has been made in many instances without resort to the microscope and the proper remedy administered.

From the facts in our possession it is certain that uncinariasis is very prevalent in our State, and that it is not limited to the sandy section, as Stiles suggests. It deserves and should receive the careful attention of all practitioners. With the lights before me I would say unhesitatingly that every case of pronounced anæmia, especially in young persons living in the country, should be investigated with a special view to this very harmful intestinal parasite.

TUBERCULOSIS.

Tuberculosis continues our most fatal disease. Experience has demonstrated that much can be done for its prevention. We should therefore make an earnest effort to check its ravages as far as possible. I therefore bring the matter forward in order that it may be discussed in the conjoint session, so that we may have the benefit of the wisdom that is said to appertain to a multitude of counsellors.

The question of the prevention of tuberculosis is theoretically easy, but practically most difficult—very much more so in our Southern

country than elsewhere on account of the large number of negroes. The infectious principle being existent only in sputum and other discharges from tuberculosis cases and in the infected milk and meat of the lower animals, the thing to do, of course, is to destroy the sputum and prevent the sale and consumption of the tuberculous milk and meat. But *how* to accomplish this in actual practice to more than a most superficial extent is the question. The answer to this question is, by the thorough education of the public mind on the subject. So the practical problem is how to reach and influence the people, especially those having the disease and their immediate families who necessarily are in close and constant contact with them.

The first step in the solution of this problem is to locate the tuberculous patients. To accomplish this a few States and cities have resorted to legislation requiring compulsory notification of tuberculosis as of other contagious diseases, so that the proper instructions may be given, inspections made and disinfection practised. This looks well on paper, and in large cities with thoroughly organized health and police departments and sufficient money to support them it is no doubt of much practical value. But in communities such as our State, the population of which is chiefly rural or resident in small cities, towns and villages without the full facilities for enforcement indicated, we cannot expect very much from this means. Especially is this true of the colored people. Their temperament, training and environment make the solution of the problem in their case, to all intents and purposes, hopeless—for many years to come, at any rate. And it is among them the disease is most prevalent, in the proportion of nearly three to one of the whites. That we cannot expect much is the more apparent when we call to mind the fact—the most discouraging fact—that a very large percentage of our physicians, although required to do so by law, will not report the more actively contagious diseases, such as scarlet fever, diphtheria and even small-pox, although the last-named disease is, we believe, generally reported, but not so much because the law requires it as because the doctor wants to get rid of it. In the present state of public sentiment the indisposition to report tuberculosis will be much greater. At the same time it is desirable to have this done if it can be brought about. We are glad to say that our own city of Raleigh has enacted stringent legislation on this line, and the results will be watched with much interest, as it is the first movement in the State for compulsory notification, although anti-spitting ordinances have been in force several years, first in Asheville and later in Raleigh.

The methods usually resorted to for the education of public sentiment are tuberculosis congresses, the organization of anti-tuberculosis societies, public addresses, newspaper articles, the distribution to the individual of literature bearing on the subject and the establishment of special sanatoria. And this crusade has evidently borne fruit, for the decrease in the death-rate from tuberculosis has been

much more marked in the decade 1891-1900 than in any similar period previously. It is interesting to note, however, that the death-rate had been steadily diminishing in our larger cities before Koch's discovery of the bacillus and the demonstration of its contagious character. This is attributable to the improvement in the condition of the masses, better housing, better food, shorter hours of labor, the bicycle, athletic out-door games and the open-air life, has come to be the vogue, thereby begetting greater resisting power. In these respects the advance has been much greater in the past decade than before, and it is no doubt to no inconsiderable degree responsible for the decreased death-rate.

In the prevention of infection with the tubercle bacillus there are three principal objects to be sought: 1. The building up of greater resisting power in the individual. 2. The prevention as far as possible of the development of the bacilli. 3. The prevention of their distribution by their prompt destruction.

1. The dangers of the inspiration or ingestion of the bacilli are so great that it is a matter of doubt if any one living even a few years has not at one time or another taken them into his system, and yet only about one-ninth of the population, it is estimated, become fatally infected. This is due to the protective or resisting power inherent in every one to a greater or less extent. It is well established that this power to resist disease, to repel it entirely, or to overcome it is greater in those who are in vigorous health. And this state of vigorous health is to be attained and preserved by living in accordance with the principles of hygiene, special stress being laid upon the paramount importance of pure, fresh air in the greatest abundance and at all times as near an out-door life as possible.

2. The prevention of the development of the bacilli is to be accomplished chiefly by an *early diagnosis*, when the disease is a pure tuberculosis and before the degenerative changes which constitute consumption have taken place. In the former the bacilli, being tied up in the unbroken tubercles, are not thrown off to any extent, while in the latter they are discharged in the sputum by the million. I would earnestly commend to your careful perusal a very able article, appearing originally in the *New York Medical Journal* and reprinted in our January BULLETIN, on the subject of "The Relation of Early Diagnosis and Treatment to the Prevention of Tuberculosis," by Dr. Pottenger, president of the Anti-Tuberculosis League of Southern California. He estimates that from 75 to 95 per cent. of early cases, with proper care, should be cured, thereby preventing the development and distribution of the myriads upon myriads of bacilli from the same cases going on in the consumptive stage. Dr. Pottenger says that the expert in tuberculosis "should be able to determine the presence of the disease in the vast majority of cases before bacilli appear in the sputum by the clinical history and physical examination. If not by these," he goes on to add, "the tuberculin test can be used with con-

fidence and safety." I beg to emphasize this last statement, for while I know that some object to the use of the tuberculin test in the human, claiming that it is sometimes harmful, the early diagnosis in the tuberculosis stage is of such overwhelming importance to both the patient and the public that inasmuch as it will enable the comparatively inexpert to make the diagnosis with certainty, the little risk, if there be any, should, in my judgment, be taken in doubtful cases. In any event, there can be no excuse for failure to resort at once to the microscope in every suspicious case for the detection of the bacilli upon their first appearance in the sputum, for the examination will be made free of charge for any physician applying to the laboratory of the Board of Health.

3. The prevention of the distribution of the bacilli must be accomplished by the patient himself. He can do this by the invariable habit of expectorating only into spittoons partially filled with some disinfectant, or into the fire when in the house, and by the use of a pocket spittoon, bits of cloth or paper napkins (never the handkerchief) that can be burned, when out of doors. In a word, he must never let his sputum get away from him except into a disinfectant or the fire; never turn it loose to dry and assume the form of dust, especially in the house.

Having thus outlined the problem very inadequately, but as fully as the limits of this report and your time permits, we now come to the all-important question as to how we can best solve it.

The most conspicuous movement at present is towards the establishment by the State of special sanatoria for the tuberculous. Experience has demonstrated their great success, not only in curing the disease in its incipient stage—in over fifty per cent.—but chiefly as educators of the people, for every patient returning to his home thoroughly trained in the proper management of his case, so as to prevent the reinfection of himself and the infection of others, is an educator for his neighborhood. But at present, and doubtless for some years to come, we cannot hope for an appropriation by the State for this purpose. The other methods generally employed to educate the people and prevent the spread of disease by compulsory notification, distribution of literature, organization of societies, etc., have already been referred to, but it seems to me that the most effective method of reaching and attacking the very citadel of the enemy has never been sufficiently emphasized. This method I believe to be through the family physician. It is the family physician who first locates the case of tuberculosis; it is he who is sought for advice by the patient and his friends—no one can get so near to the problem as he, and no one can have such influence as he in securing the proper management of the case on the part of both the patient and family. No health official nor organization can compare with him in the practical accomplishment of this work if he can be induced to do it. Even if all the cases of the disease could be located and the proper instructions for

prevention furnished—a manifest impossibility without his aid—they would make but little impression unless re-inforced by his endorsement and earnest personal advice. He is the medium—and the only medium in the vast majority of cases—through whom the principles of preventive management can effectively reach the individual case. It would be superfluous to argue this matter further. It is self-evident that the solution of this great and difficult problem, the greatest health problem of this or any age, turns chiefly on the attitude of the attending physician. The practical question before us, then, is: How can we arouse his interest and secure his cordial co-operation in the work? It is this particular question that I wish to hear discussed, that I may be helped in the performance of my official duty in the premises.

I would respectfully suggest that this body, composed of a very large proportion of the leading physicians of the State, put itself on record by adopting some such resolutions as the following:

WHEREAS, tuberculosis, of all diseases the most fatal, being the cause of death in about one-ninth of all who die, is a contagious and therefore preventable disease; and

WHEREAS, its prevention depends upon the early diagnosis, upon the strict observance of certain precautions in the relations between the patient and his associates and upon a mode of life in accordance with the well-established principles of hygiene; and

WHEREAS, these matters come within the immediate jurisdiction of the attending physician, whose influence in securing their observance is far greater than all other influences combined: therefore, be it

Resolved, That it is the sense of the Medical Society of the State of North Carolina and of the North Carolina Board of Health in conjoint session assembled, that the spread of tuberculosis, the greatest scourge of mankind, can be most effectively prevented only with the active aid and cordial co-operation with the health authorities of the family physician.

Resolved, That not only every member of this body, but every physician in the State, is earnestly requested to use every effort, professional and personal, to promote this great work for humanity.

I would also suggest the propriety of adopting the following:

Resolved, That it is the sense of the State Board of Health and of the State Medical Society in conjoint session assembled, that provision should be made in our hospitals for the insane and in the State's Prison, and in the county jails as far as practicable, for the separation of tuberculous cases from the other inmates uninfected with the disease.

(Both resolutions were adopted unanimously).

SMALLPOX.

As was anticipated in our last report, smallpox has continued with us to an increased extent. The total number of cases during our smallpox year—May 1st to May 1st—is 5,370, as against 4,456 the year before. Of this number 2,840 were white and 2,530 colored, with 35 and 34 deaths, respectively. It will be noted that for the first time the disease was more prevalent among the whites. The death-rate was the smallest in the history of the recent outbreak, being 1.23 per cent. among the whites and 1.34 per cent. among the colored. We have experienced the same difficulties in the management that have confronted us all along, due chiefly to the extreme mildness of the disease, although they have been somewhat less than heretofore.

At the request of the authorities of the city of Durham, who were experiencing much opposition to vaccination, I visited that city and addressed the people on the subject, with good results following.

The general smallpox outlook seems to be the same it was a year ago. It will continue from year to year until all the people have been successfully vaccinated or had the disease.

The following is a report in detail for the past year :

REPORT OF SMALLPOX FROM MAY, 1903, TO MAY, 1904.

Counties.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Alamance	325	19	344	2		2
Alleghany	7		7			
Anson	6	148	154			
Ashe	200	16	216	4	1	5
Bertie		4	4		1	1
Bladen	24	1	25	2		2
Buncombe	43	19	62		3	3
Burke	7	5	12			
Cabarrus	36	1	37			
Caswell		82	82		2	2
Catawba	4		4			
Chatham	4	3	7			
Cherokee	23		23			
Chowan		1	1			
Cleveland	19	13	32			
Columbus	50	150	200		1	1
Cumberland	7	11	18			
Davidson	137	253	390	12	13	25
Davie	43	149	192			
Duplin	7	16	23			
Durham	40	300	340			
Edgecombe		9	9		2	2
Forsyth	47	53	100			
Gaston	35	16	51	3		3
Greene	2	35	37		2	2
Granville	6	13	19	2		2
Guilford	94	7	101			
Harnett	30		30			
Haywood			1			
Henderson	44	7	51			
Iredell	21	10	31			
Jackson	50		50			
Johnston	29	4	33			
McDowell	6	7	13			
Macon	40	10	50			
Madison	577	12	589			
Mecklenburg	6	15	21			
Montgomery		52	52			
Moore		1	1			
New Hanover	25	7	32			
Pender	1	7	8			
Perquimans		34	34			
Person		13	13			
Pitt	18	10	28			
Polk	7	28	35			
Randolph	23	3	31			
Richmond	27	34	61		1	1
Robeson	300	700	1,000	2	3	5
Rockingham	11	28	39			
Rowan	22	6	28	3		3
Rutherford	75		75			
Sampson		9	9			
Scotland	20	72	92			
Stanly	54		54			
Surry	49	4	53			
Swain	5	1	6			
Union	1	15	16			
Vance	42	1	43	3		3
Wake	4	12	16		1	1
Warren		5	5		4	4
Wayne	5	60	65			
Wilkes	102	36	138	2		2
Wilson	12	3	15			
Yadkin	27		27			
Yancey	30		30			
Total (in 65 counties)	2,340	2,530	5,370	35	34	69
Death rate, per cent.				1.23	1.34	1.28

LABORATORY.

The following is the report of Dr. McCarthy, the Biologist, in detail of the work done for the Board of Health in the joint laboratory of the Department of Agriculture and the Board of Health during the past year:

REPORT OF BIOLOGIST.

RALEIGH, May 5, 1904.

DR. RICHARD H. LEWIS,

*Secretary North Carolina State Board of Health,
Raleigh, N. C.*

DEAR SIR:—I herewith submit a detailed report of the work done in the laboratory of the Board of Health during the twelve months included in the period from May 1, 1903, to April 30, 1904.

Total number of analyses and determinations..... 522

These include the following samples, to-wit:

Public water supplies, monthly analyses..... 226
Analyses of water for physicians and health officers of counties.. 136
Examinations of sputum for physicians..... 57
Examinations of throat exudates, diphtheritic..... 53
Examinations of blood for plasmodium malarie..... 18
Examinations of fæces for hookworm..... 32

Total..... 522

The official examinations of public water supplies, under the law passed by the last Legislature, was begun in May, 1903.

No work was done in the laboratory during June. The full number of analyses required of the water companies under the law was therefore eleven. This number was actually taken by only four companies; the others, by carelessness or other causes, falling below the requirements of the law, as shown by the annexed list:

<i>Water Companies.</i>	<i>No. of Analyses Taken.</i>	<i>Water Companies.</i>	<i>No. of Analyses Taken.</i>
Asheville	7	Raleigh	11
Concord	2	Reidsville	6
Charlotte	10	Rocky Mount	10
Dunn	1	Roxboro	6
Durham	10	Salem	9
Fayetteville (municipal)	8	Sanford	6
Fayetteville (old system).....	0	Salisbury	10
Gastonia	9	Southern Pines	9
Goldsboro	10	Statesville	7
Greensboro	11	Tarboro	7
Henderson	8	Waynesville	6
Hendersonville	5	Washington	7
High Point	6	Wadesboro	3
Lumberton	6	Wilson	11
Monroe	8	Wilmington	11
New Bern	5	Winston	10

It must be said in justice to a few of these water companies that they began business during the year, and could not therefore take the full number of analyses. The companies included in this latter category are Dunn, Hendersonville, Roxboro.

The law directs the Board of Health to make these analyses for a charge of \$5 each. The usual cost of biological analyses of water is \$10 each. When we began this work it was with the idea of making only the biological analyses in the laboratory of the Board of Health, the chemical analyses to be made, if possible, by the Department of Agriculture. But, in fact, the chemical work was not done except in a very irregular way. The Department of Agriculture is supported by a special tax levied upon the farmers of the State. It is supposed to devote its energies entirely to strictly agricultural work. What work the Department can do in other lines must depend upon the chemists being unengaged.

Water analyses, to be of much value, must be made regularly and systematically. It was therefore determined to do the chemical as well as the biological work in the laboratory of the Board of Health.

Soon after starting the chemical work we found that the larger part of the water companies were using too much alum in their filters and passing a part of this into the filtered water. The various companies were notified of this fact, and, though there was at first some indignation expressed upon the imputation cast upon their waters, the companies soon improved their services and apparatus, so that the last or April series of analyses showed for the entire State but two supplies giving the reaction for alum, and both these for only very minute quantities. We are now fully justified in stating that no State or country anywhere has municipal water supplies superior to that of North Carolina—so far as regards freedom from pollution and injurious chemical compounds. There are thirty public water companies in the State. The water of all is very soft, and, with a few exceptions, is free from organic matter. All of the supplies derived from deep wells—in number, five—contain much dissolved earthy matter, and a few approach the quality of mineral waters. The deep waters are much harder than the surface waters.

The quality and safety of the public or municipal water supplies of the State is enormously superior to the average quality of the well waters sent to the laboratory. So great is the difference that the Biologist, as the result of four years' work in this line in North Carolina, is disposed to say that no incorporated town having 1,000 inhabitants can afford to permit its citizens to be supplied by private wells of the ordinary shallow type. The danger of typhoid hangs like the sword of Damocles over every community getting water from shallow wells. This danger is minimized for communities having a common supply which is closely guarded and the quality kept up to the standard by monthly analyses, such as our State law requires. It would therefore seem to be the duty of health officers and physi-

ciens to advise even small towns to abandon shallow private wells for a common public water supply.

As regards the samples of well water sent by physicians and county health superintendents, I am able to say that the average quality is superior to that received during the preceding year. There were fewer grossly polluted samples.

Of the fifty-seven samples of sputum received, about one-third were free from bacillus tuberculosis. The samples showing the bacillus came from different parts of the State, but chiefly from the Central and Piedmont regions.

Of diphtheritic exudates fifty-three were received, and all but two showed the bacillus. Nearly all samples of exudates were described by attending physicians as "tonsillitis" or "membranous croup." Determinations of diphtheritic exudates were given precedence over all other lines of work in the laboratory, and the result is, in all cases where the physician can be reached by telegraph so transmitted, usually within one hour after sample reaches the laboratory. We could handle more of this class of work.

In examinations of blood for the malaria parasite our facilities are not yet appreciated by the medical profession, or else the type of malaria found in North Carolina is easily diagnosed clinically. Only eighteen samples came in, and the larger part of these were free from the germ. Only the tertian parasite has been found.

Of feces we have received thirty-two samples, and all but four contained the hookworm or its eggs. Most of the samples also showed large quantities of sand, indicating recent geophagism. The ages of the patients as given by physicians varied between six and sixty-one years. The larger part were under twenty-five years. The samples came from the following counties: Caldwell, Iredell, Granville, Johnston, New Hanover, Mecklenburg, Nash, Stokes and Wake.

During the past twelve months, as in the preceding period, a few applications were received for the Widal test for typhoid fever. At considerable trouble and expenditure of time and materials, the Biologist stocked suitable cultures for this work at three different times in the two years, but the demand for this work proved too small to justify us in keeping up the cultures. The average demand is only about four per year. For the Widal test the culture of bacillus typhosus must be virulent and not over four or five months, at longest, from the spleen of a person dead of typhoid. The culture must also be transferred from tube to tube at least once a week, thus entailing much labor and consumption of material. With so much other work pressing upon the laboratory, we could not afford for the small demand to keep up typhoid culture as required, so at present we decline applications for the Widal test. The clinical alternative is usually between typhoid and malaria, and an examination of the blood by microscope will determine whether or not it is malaria.

A part of the Biologist's time is given to the work of the State Department of Agriculture. The work of the Board of Health alone is more than enough to occupy the entire time of one man. Therefore, until such time as the Legislature sees fit to provide for the entire support of the laboratory, no further extension of the work is possible.

Respectfully submitted,

GERALD MCCARTHY, D.Sc., *Biologist*.

It will be observed that many of the public water supplies have been quite derelict in the matter of monthly analyses. The act to protect water supplies requires every company selling water to the public to have an analysis made every month by the Board of Health or in such laboratory as it may select, and yet in a total of 334 analyses required only 226 sent samples. I have tried faithfully to induce them by gentle means to send the samples regularly and promptly. My last letter has borne fruit, but there are some still that neglect this duty. While the law provides a penalty for failure to have the analyses made, it is manifestly undesirable to resort to the courts. Public opinion is the best lever to employ, and if the physicians living in cities and towns having public supplies would interest themselves in the matter the companies would be more apt to respond. It is of great importance that they should, not only as a guarantee to consumers of the purity of the water sold them, but also as a means of support to the laboratory. Thanks to an enlightened, broad-minded Board of Agriculture and a Commissioner cordially in sympathy with this work for the people, we have been enabled to do the very creditable amount of work for the public health shown in the report, but times change and men change with them, and the support of the laboratory is extremely precarious. It should be sustained by a direct appropriation by the State for the purpose, and it is to be hoped that it may be made by the next Legislature.

While Dr. McCarthy, having no assistance, could hardly do more work than he has done, still it is discouraging to note how comparatively few of our physicians avail themselves of the privileges offered free of cost beyond a few cents of postage. The number, however, is growing, and will no doubt increase more and more as time passes.

In conclusion, I appeal to the members of our noble profession to lend their interested support in this great work in which we are engaged. While some are disposed to sneer, and while it must be admitted that the spirit of commercialism which pervades all callings at the present time has not left us untouched, it still remains true that, excepting perhaps the sacred ministry, there is no body of men whose hearts are so open to the cry of distress or whose minds and hands are so ready to administer to its relief without pecuniary reward as the physicians of our country. It is a noble profession, and on the principle of *noblesse oblige* it is the duty of every physician, and should be his pleasure, not only to cure disease and suffering, but also to aid in their prevention.

CHAIRMAN: The report is before the house. Any discussion of it?

DR. STEPHENS: I want to say just one word as to tuberculosis. The worthy Secretary, in calling attention to the prevention of tuberculosis, speaks of education of the laity in regard to preventative measures. These things are matters of importance, but there is one thing even greater—the educating of the family physician in those things which are necessary to make early diagnosis. If the family physician is qualified to do this the education of the laity will follow. The family physician needs to have impressed upon him the fact that it is his duty to examine the sputum of a patient having a cough of more than one week. It is his duty to examine the chest carefully in every case of declining health and not let false ideas of modesty stand in the way. It is his duty to see that an examination is made. I would also suggest that the figures mentioned in the resolutions suggested by our worthy Secretary be changed to this effect. He mentions the fact that one-seventh of the deaths is due to tuberculosis. Our last census makes it between one-ninth and one-tenth, and the last census of our own State gives the figures as 11.15-100 per cent. of the total mortality of the State.

DR. ———: I wish to call attention to the fact that something should be done for the prevention of infection in the public institutions. This is a crying need and one in which the people of the State and the physicians should be interested. It is appalling to see the number of necessity infected in the public hospitals.

DR. PAQUIN: It is rather a source of congratulation to me that our Secretary has so emphasized the matter to which I called the attention of the Society on yesterday. It is the most important subject in the domain of medicine to-day. It is true that prevention is the key to the situation. The practical solution of this question is the great desideratum

in our State. How shall we succeed in combating this enemy? As I said on yesterday, let every man of you constitute himself a committee of one to go home and teach the community at large how to prevent, and himself how to diagnose, the disease. A great many physicians fold their arms and say they can not diagnose that disease. They say, "What can't be cured must be endured." The microscope is only confirmatory of the opening symptoms of the disease. There are signs and symptoms by which the ordinary physician can diagnose the disease in its early stages. What are they? Physical examination of the chest, the temperature and tuberculin test. By these three methods you can tell whether the disease is tuberculosis or consumption. Let us go home and perfect these methods. It is useless for me to go into details. If you will make a diagnosis early while yet in its incipency, this cruel disease will not carry so many to an untimely grave, and prevent the infection being distributed in different portions of the country. Therefore, in view of this, I move that we adopt the resolutions as suggested by our worthy Secretary. Now, gentlemen, I move for the adoption of these resolutions as a whole, unless some one calls for them separately. The motion was carried.

DR. LEWIS: There is a fault with a great many of us—that of being a little too kind-hearted sometimes and of not being perfectly candid in informing the patient or family that it is a case of tuberculosis. It is a very painful thing to do to tell the patient or family that it is a case of tuberculosis, but it is important that they should know and take necessary steps to cure it.

CHAIRMAN: Any further discussion?

DR. FAISON: I think it is right to make a diagnosis early. I think a law should be passed preventing any one having tuberculosis from coming within our borders.

DR. LEWIS: I think it would be helpful when the Legislature meets if a resolution should be adopted by this body

for an appropriation by the State for a biological laboratory. I think it would be helpful to us.

DR. IVEY: I move that this body ask the Committee on Legislation to approach the coming Legislature in reference to that point.

The motion was made and carried.

DR. LEWIS: I have not received the advice I want—the best practical method of reaching the family physician. You are all family physicians. You can tell me very much better than I can how to reach yourselves. Make me some suggestion by which I can reach the profession and I will be very much obliged. How would a personal letter with a two-cent stamp on it do? Leave off the heading of “Board of Health.” Have it directed by a lady and it would be opened and read.

DR. STANCILL: I would like to suggest an evangelist from the State Board of Health making a visit to the family physicians. In the long run it would pay.

DR. LEWIS: I thought that idea was ventilated some years ago. If we could get the State to appropriate for an evangelist it would be the best plan, but it is impracticable.

DR. ROBERTS: There are in every county men who are competent to write up these subjects. Dr. Lewis is acquainted with the medical profession, and he knows who to apply to in each county. Let us ask each physician in each county to write up on these subjects which he wants investigated. I know it would not be successful in every case, but it will accomplish something. I think a great deal can be done through the County Medical Societies, and if you reach one in ten you have done something. * * * It is only by line upon line, precept upon precept, that you can do anything along this line.

DR. LEWIS: It is the intention to put literature on this subject in the letter to the physician.

Dr. ———: We are better prepared than ever to cope with this disease. We have County Societies in every State, and with the assistance of the State Board of Health in sending literature and letters to the physicians in the county and waking them up to the importance of this subject, this matter may be worked out at our home in the County Medical Societies. There is no remedy for the prevention of tuberculosis unless it commences at home among the people and among the doctors—the doctors that go in and out among the families. The Society should select some man to write and read a paper and work up an interest in the County Medical Societies.

CHAIRMAN: We have the report of the Secretary that requires adoption.

Motion was made to adopt the Secretary's report. Motion carried.

Motion was made for adjournment of the conjoint session. Motion carried, and the conjoint session was adjourned.

REPORT OF BIOLOGIST.

The biological work of the State Board of Health as at present carried on was begun in 1901, when by the liberality of the State Board of Agriculture the Secretary of the Board of Health was permitted to send samples of suspected drinking-water to the biological laboratory which the Board of Agriculture had recently established for its own particular work. The great hygienic value of biological analyses, especially in regard to drinking-water, soon became apparent, and June 1, 1903, the Board of Health arranged with the Board of Agriculture to share the expenses and facilities of the laboratory already established.

The principal line of work carried on on the part of the Board of Health is water analysis. A large amount of work is, however, done in examining pathological samples, including sputum for bacillus tuberculosis; throat exudates for bacillus diphtheriæ; feces for uncinaria; and blood for the parasite of malaria.

As showing the increase in volume of work and in the interest and favor with which the work is regarded by the medical profession, the following figures showing the total number of samples examined in the laboratory for each of the four years are hereto appended:

Total samples for 1901.....	294
Total samples for 1902.....	357
Total samples for 1903.....	476
Total samples for 1904.....	785

Approximately two-thirds of these samples were water. The remainder were pretty evenly divided between the different classes of pathological samples above-named.

The Legislature of 1903 amended the law governing public water companies so that the Board of Health was required to make a monthly biological analysis and a quarterly chemical analysis of each water supply. The Board was empowered by this act to charge a fee of \$5 for each biological analysis, but no provision was made for paying for the chemical analyses, which are therefore made free by the biologist. The fees received from the water companies and one-half the salary of the biologist paid by the Board of Agriculture, constitute at present the sole income of the laboratory, notwithstanding the fact that about one-half our laboratory work is done free of charge for physicians of the State.

The practical value of the monthly analyses of the public water supplies cannot be overestimated. These systematic examinations serve to assure the patrons of water companies that no pollution of

the supply can occur without being quickly detected. A good illustration of the value of regular and frequent examinations of a public water supply is furnished by the experience of the town of Butler, Pa. This town has a population of 18,000. It had an apparently efficient system of water-works, but made no regular biological examinations of the water. During the summer of 1903 some accident occurred to the filter which remained for a time undetected, and for that time passed into the service mains water practically unfiltered. The first warning the water company had of the break-down in the filter was the outbreak of typhoid fever among the water consumers. A severe epidemic ensued, resulting in the death of 111 persons and the serious illness of 1,348 others. First and last, the expenses of this epidemic, besides loss of life, were estimated to be not less than \$40,000. The experience with typhoid fever in Butler, Ithaca, Watertown, Plymouth, and other cities having public water supplies but not controlled by frequent and regular biological examinations, proves conclusively that typhoid fever may be spread to a most disastrous extent by such waters, and that without efficient control by biological analysis no consumer can feel safe in using such water.

The monthly analyses of water supplies now provided for by the law governing water companies in North Carolina enable the biologist to detect even the smallest trace of pollution, and by promptly advising the responsible officers of the water companies concerned, the source of the contamination can be discovered and the pollution stopped before the health of the water consumers is affected. In this manner the public health is safeguarded and at the same time the interests of the water companies protected. Reports of pollution are treated confidentially so long as the companies show the proper zeal in remedying the trouble. More than one water company in North Carolina could certify to the assistance the Board of Health's laboratory has been to them in protecting the health of their patrons and, by preventing panic among patrons, the financial interests of the companies.

In a general way, we can say that no State now has a purer, more wholesome or better-guarded system of water supplies than North Carolina. The mechanical system of filtering water is exclusively used in this State. Alum is employed to coagulate suspended matter and clear the water. When we made our first chemical analyses of these waters we found that a large proportion of the water companies were passing free alum in notable quantities into the filtered waters. We at once notified these companies, and with commendable promptness most of the companies improved their methods in so far that for some time past the average alum content of filtered water has been not more than one part per million. This amount is entirely negligible. So long as the alum process of filtration is used, by no practicable method can the filtered water be entirely freed from this substance. Some complaints have been made by boiler inspectors that

the free alum in filtered water was injurious to steam boilers. But it is apparent that such an infinitesimal proportion of alum in the water as we have named can have no appreciable effect upon the steel shells of boilers unless the boilers remain uncleared for very long periods. Most unfiltered waters contain notable quantities of magnesia, soda and other substances which affect steam boilers injuriously. From these substances most of our filtered waters are almost wholly free.

Of the total number of water samples analyzed in the laboratory about one-third are physicians' samples of well-water from houses where typhoid fever has prevailed and where the well is suspected of being the source of the infection. Our earlier work in this line showed a most unfortunate condition of affairs, since the great majority of the samples received were badly polluted. During the last year, however, the majority of samples of well-water analyzed have been of very fair quality and free from fecal contamination. It is the general custom in villages and farm-houses to have an open privy or pit within one hundred feet of the house. Where flies abound they pass from the house to the privy and back, carrying upon their feet and frequently deposit upon food-stuffs small particles of fecal matter, which may contain the germs of typhoid. Such germs are excreted in enormous numbers by all typhoid patients and by convalescents for some weeks after recovery. It is both practicable and easy to use closed receptacles in privies, or to cover dejections as soon as deposited with dry earth, ashes or lime. Houses having water-closets should have wire screen-doors to keep out flies. Finally, every house in which there is a case of typhoid should be required to use disinfectants freely upon all excrementitious matter and upon all clothing soiled by the patient.

Beginning in the summer of 1903 a vigorous campaign has been carried on by the Board of Health against the Hook-worm parasite, *Uncinaria Americana*. The presence of this parasite was first brought to the knowledge of the physicians of the State by Dr. C. W. Stiles of the United States Public Health and Marine Hospital Service, at the meeting of the State Medical Society in 1903. This loathsome and destructive parasite has been shown by our work to be present in all the counties of the State east of the Piedmont section. So far no sample of *Uncinaria*-infected feces has been received from beyond the Blue Ridge.

There is a constant all-the-year demand upon the laboratory for examinations of sputum from suspected cases of tuberculosis. The greater part of such samples received do in fact show the germ of tuberculosis. Tuberculous sputum is the most dangerous class of samples received at the laboratory. We are sorry to say that not a few physicians are so reckless as to send such samples in containers not authorized by the Board of Health and which are forbidden by United States law to be carried in the mails. Such physicians fre-

quently excuse themselves by saying they are in a hurry and cannot wait for the authorized mailing cases supplied by the Board for this use. These physicians seem to forget that there may be a hundred other physicians wanting similar work done, and all equally in a hurry. The rules of the Board of Health governing the laboratory, and the rules of the United States Post-office regulating the transmission of infectious matter through the mails, are very reasonable and are in fact necessary to safeguard the health of those who must handle the samples. The routine of our laboratory aims to treat every physician alike, and to take up samples in their regular order. Physicians who deliberately disregard our rules have only themselves to blame when their samples are consigned, unexamined, to the fire. *Verbum sap. sat!*

From the time when the public schools open in the fall until about May 1, the examination of throat exudates from suspected cases of diphtheria form a very considerable part of the work of the laboratory. The type of diphtheria prevalent in North Carolina seems to be of a very mild form, in so far that physicians generally refuse to diagnose the disease from the clinical symptoms. Most of the samples sent to the laboratory are labeled "Tonsillitis" or "Croup." Yet the great majority of these samples show the true *Bacillus diphtheriæ*. The bacteriological process does not distinguish between virulent and feeble varieties of the germ.

Very few physicians who have secured a positive original diagnosis of *Bacillus diphtheriæ* send samples from the convalescent patient as recommended by the National Conference of State and Provincial Boards of Health in the following words:

"Resolved, That the isolation of any person affected with diphtheria or so-called laryngeal or membranous croup, and of the nurse or nurses attendant upon such person, shall be absolute and shall be governed by the following regulations: * * * * *

"Whenever the presence of the *Bacillus diphtheriæ* is in any manner reported by an approved bacteriologist, the house should forthwith be quarantined and a plainly printed notice thereof, including the name of the disease, should be posted in a conspicuous place thereon, and guards stationed if necessary.

"After proper disinfection, quarantine shall be removed from those houses in which diphtheria has been diagnosed, when synchronous cultures taken from the noses and throats of all persons quarantined have been pronounced to be free of diphtheria bacilli by a bacteriologist approved by the State Board of Health.

"After the laboratory diagnosis of diphtheria has been given, it shall be the duty of the health officer to see that specimens from both nose and throat of the patient are forwarded by himself or the attending physician to a laboratory approved by the State Board of Health, once a week after clinical symptoms have subsided, until negative reports for both nose and throat are obtained."

It is probable that the spread of this disease in epidemic form is very largely due to the neglect of isolating the patient until the germ has disappeared from throat and sputum.

A comparatively small number of samples of blood are sent to the laboratory for examination for the parasite of malaria. Most of the samples received are free from the parasite. This seems to indicate that physicians either use quinine before taking the samples or else send only from cases of obscure continued fevers which are not malarial.

The laboratory receives a very few demands for the Widal test for typhoid. The Widal test is easily made, but for trustworthy results the culture of the typhoid bacillus used to agglutinate must be fresh and virulent. To procure and keep up such cultures requires too much labor for the trifling demand for this work, so at present we decline to make the Widal test.

The laboratory receives an occasional freak sample supposed to contain the "germs" of cancer or scarlet fever. While the biologist is always willing to give a brief answer to a courteous request, with our facilities already overtaxed, physicians must understand that no samples requiring special research can be accepted. The germs (if germs there be) of cancer and scarlet fever are not known to science. It is not the business of our laboratory to search for unknown germs.

With present facilities and lack of sufficient financial support, there is little prospect of broadening the scope of our work. With increased means the laboratory might, with great benefit, add to its present lines of work biological diagnosis of rabies and of pneumonia. It might also undertake to test the qualities of the drugs and medicines usually prescribed by physicians. Those States which have investigated the quality of drugs sold, especially in the smaller towns, have found a most alarming condition of affairs. For example: Massachusetts has found that practically all the "diabetic flour" sold in that State at about fifty cents per pound was little better than ordinary whole wheat flour. This is one of the most despicable impositions practiced upon a credulous and helpless public. All the medicinal wines were found to be spurious and most aromatics below standard strength. Unless the physician can depend upon the purity and strength of the drugs he prescribes, no amount of skill will avail to save his patient, and the reputation of the physician must suffer. This is a very serious matter and should have the earnest consideration of the Board of Health as well as of practicing physicians.

It is necessary to call your attention and the attention of the physicians of the State to the insufficient and precarious support of the biological laboratory. There seems to be a loose impression among the profession that the whole power and wealth of the State is back of the laboratory and that the amount of work to be had for the asking is practically unlimited. The fact is that the State does

not contribute one cent to the support of the laboratory. Our sole source of income is the fees received from public water companies. These companies are supposed to get their work done at the actual cost, and if we consider that for an annual payment of \$60 each company receives twelve bacteriological analyses and four chemical analyses, it is apparent that there can be little profit to the laboratory.

The biologist has made free of charge for physicians and the general public during the last twenty months, 850 analyses. It will be impossible to continue this work unless the State appropriate sufficient to cover the actual cost of this work. The laboratory needs at least \$1,500 per annum above what it earns in fees. With such State aid we will be able to continue our free work and to extend it by adding to our present list the biological diagnosis of rabies and some other diseases, and possibly we may give some attention to medico-legal work, as in examination of blood stains, etc.

The salary of the biologist is insufficient; he needs an assistant and a clerk or stenographer.

The biologist has for over a year accepted an excessive amount of work, being anxious to prove the practical value of bacteriological diagnosis as an aid to the practicing physician. This value has now been very fully demonstrated, and it seems to be the duty of the State or the public to provide for this work in the future.

All of which is respectfully submitted,

GERALD MCCARTHY, D. Sc.,

Biologist.

DR. RICHARD H. LEWIS,

Secretary N. C. Board of Health.

SANITARY INSPECTION OF STATE INSTITUTIONS.

PUBLIC BUILDINGS.

THE CAPITOL.

THE COUNCIL OF STATE.

GENTLEMEN:—The undersigned, a committee from the State Board of Health, visited the Capitol Building and carefully inspected the property, so far as sanitary points connected with it are concerned. We respectfully suggest that the bath-rooms now in use should be ventilated. They are built under the stair-cases and are lighted by gas, and the water for bathing purposes is heated by an instantaneous gas heating apparatus. There is no proper ventilation for these rooms, and we respectfully suggest that this is not a sanitary arrangement, and one not conducive to the welfare of those who are to use these bath-rooms. A coat of paint or whitewash over the walls of these rooms would certainly add much to their looks, and we respectfully think that it would make them healthier. In the Senate Chamber and the House of Representatives, we beg leave to repeat the warning that during the sessions of the Legislature, when both of these rooms are crowded by members of this body, and by persons in the lobby, fires should be kept in all the fire-places, to promote good ventilation of these rooms.

Yours very truly,

G. G. THOMAS, M. D.

RICHARD H. LEWIS, M. D.

Committee.

THE AGRICULTURAL BUILDING.

STATE BOARD OF AGRICULTURE,

Raleigh, N. C.

GENTLEMEN:—The undersigned, a committee of the State Board of Health, visited the Agricultural Building and inspected the plumbing and the sanitary arrangements generally in use about the building. Most of this plumbing is in the old building, and none of it appears to us to be first-class work. It is in as good shape, generally, as can be expected of plumbing of this character. We do not think the ventilation of any of the closets was properly looked after when the

plumbing was installed. We suggest that you have a competent plumber to go over the work and remodel that which is now rather badly constructed.

Yours very truly,

G. G. THOMAS, M. D.,
RICHARD H. LEWIS, M. D.,
Committee.

THE SUPREME COURT BUILDING.

THE COUNCIL OF STATE.

GENTLEMEN :—The undersigned, a committee of the State Board of Health, visited the Supreme Court Building and inspected the plumbing and the sanitary arrangements generally in use about the building. We beg leave to heartily approve the removal of the closets from the first floor of this building to the basement. This seems to be a move in the right direction. Generally speaking, the sanitary condition of this building is very good, but the closets, opening in the halls above, are entirely without any ventilation. Windows should be cut in the outside wall, both for light and air for these rooms. The building was clean, and we see no other recommendation to be made regarding the sanitary conditions.

Yours very truly,

G. G. THOMAS, M. D.,
RICHARD H. LEWIS, M. D.,
Committee.

EDUCATIONAL INSTITUTIONS.

STATE UNIVERSITY.

BOARD OF TRUSTEES,

University of North Carolina.

GENTLEMEN :—The undersigned, a committee from the State Board of Health, visited the University and have carefully gone over the sanitary arrangements of the institution. Generally speaking, these were found in excellent condition. The water supply seemed sufficient, and it has been reported of excellent character. From all reports received while there, we are convinced that this water supply will be most carefully protected from contamination, and will be ample for the purposes of the University.

The plumbing in the Carr Building appeared to us to be of poor character. It certainly needs careful overhauling, and in many places repairing. Slate floors, or some impermeable material, should

be placed under the urinals in the closets, as the floor is now badly soiled by the urine falling on it, and soaking in, and is a source of discomfort, and may be a source of disease. All these wooden floors should be replaced by marble or slate, with ample drainage for any overflow or dripping.

We respectfully call your attention to the fact that the chemical laboratory and lecture-rooms are badly overcrowded, and the removal of the hoods to make room for students has affected the ventilation of the building. This is not only detrimental to the health of the students, but is taking away from the chemical department an opportunity to do the good work which has been so signally performed by it in the past. The graduates of this department have been in demand, and it will be a serious blow to the University to have any neglect of this department and impair the high grade of teaching which has so far marked the chemical work at the University of North Carolina.

Yours very truly,

G. G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

STATE NORMAL AND INDUSTRIAL COLLEGE.

THE BOARD OF TRUSTEES,

State Normal and Industrial College.,

Greensboro, N. C.

GENTLEMEN:—The undersigned, representing the State Board of Health, in accordance with section 3 of an act relating to said Board, made on the 15th inst. a sanitary inspection of the college under your charge.

It gives me pleasure to report that I found the institution in an excellent condition, from a sanitary point of view. Of the many water-closets scattered through the various buildings, all were as they should be, with a single exception in the partially occupied Students' Building. Its water supply was cut off, but it did not appear to be in use. The President, who was with me, made a note of it for correction. I note, however, in the lavatories of the Spencer Building that privacy was secured by opaque window-shades. They should be discarded and the windows painted or frosted, for light in abundance is especially desirable in such places.

I was pleased to note the continued use of the Forbes water sterilizers. The output on the second floor of the Spencer Building was not satisfactory as to quantity. I would, therefore, suggest the installation of an additional sterilizer of such capacity as to supply, not barely enough, but more than enough water. One of the chief troubles in the hygienic management of people—women especially—is

to get them to drink water enough. The free and easy working of the vital functions is greatly helped by drinking large quantities of pure water. Its generous use, therefore, should be encouraged in every way.

The Infirmary is too small, I think—certainly incomplete—in that no provision is made for contagious diseases. Owing to the occurrence of three cases of diphtheria in the past few weeks the second floor was cut off from the remainder of the building for their accommodation, and in consequence the quarters for the ordinary sick were at one time overcrowded. This is, of course, inadmissible in the proper care of even the well, and ample provision should be made to avoid it. A separate building for contagious diseases should be erected, or an annex to the present Infirmary, connected by a covered way with open sides, should be built. A still better plan, if possible, would be to use the present Infirmary for other purposes and build a new one in a more retired part of the grounds.

The cold-storage plant, I was informed, is only rented—a temporary arrangement, no doubt due to lack of funds. It should be purchased, or, in any event, made a permanent fixture of the institution. It occasionally happens that under the influence of heat certain organic poisons, known as ptomaines, are developed in milk and meats and cause serious illness. This should be guarded against.

Very respectfully,

RICHARD H. LEWIS, M. D.

COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS.

THE STATE BOARD OF AGRICULTURE.

GENTLEMEN:—Having made a sanitary inspection of the College of Agriculture and the Mechanic Arts, the undersigned, appointed by the State Board of Health to make the inspection, beg leave, as required by the act relating to the Board of Health, to report to your honorable body as follows:

The sanitary condition of the College as a whole is good, and we found only one thing to criticise. We refer to the surface privy, the same, with the exception of the water-closets in the hospital, being the only convenience of the kind for the large student-body. As a surface privy it is well arranged and well cared for, but it is the method of disposal of human feces to which we object. For such an institution in this day of sanitary progress it is an anachronism. It is, however, as a possible source of disease that it is to be condemned. Typhoid fever is the one of all the more serious diseases to which the young adult is most susceptible. Most frequently it is conveyed by infected drinking-water, but its transmission by flies is now a well-established fact. As the College is a military school, the

most apt illustration we can suggest is the experience of our troops during the recent Spanish war. In some of our camps, notably at Chickamauga, typhoid fever became such a scourge that the government appointed a commission composed of three of the most distinguished sanitarians in the country to investigate the matter. After a most careful and thorough inquiry they reported the cause of the spread to be chiefly flies, excluding the drinking-water, which they found to be pure. The germs of the disease are found in the discharge from the bowels and bladder. The flies crawling over the surface of the pits infected their feet and afterwards planted them on the food in the kitchen and mess tents. Thousands of cases were caused in this way. On a smaller scale the same thing might happen at the College. In our opinion, in order to avoid this danger a system of sewerage should be installed and the surface privy abandoned.

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

AGRICULTURAL AND MECHANICAL COLLEGE FOR THE COLORED RACE.

THE BOARD OF TRUSTEES,

A. and M. College for the Colored Race, Greensboro, N. C.

GENTLEMEN:—Having been designated by the State Board of Health for the purpose, I made a sanitary inspection of the College on the 15th inst. I found it in as good condition as the nature of the plant will permit.

I note the absence of any provision for taking care of the sick. This should be remedied by all means, by the erection of a separate infirmary, so that in case of the appearance of contagious disease the proper isolation could be carried out.

The bathing facilities could be enlarged to advantage, I think.

The surface privy, while apparently fairly well kept, should be abandoned and a system of sewerage substituted. This can be done at comparatively small expense by the method known as subirrigation, as most of the work could be done by the students themselves and the amount of sewer-pipe required would be small. I commend this matter to your careful consideration.

Respectfully,

RICHARD H. LEWIS, M. D.,

Secretary of State Board of Health.

SCHOOLS FOR THE DEAF AND DUMB AND THE BLIND, AT RALEIGH.

THE BOARD OF DIRECTORS,

Schools for the Deaf, Dumb and the Blind, Raleigh, N. C.

GENTLEMEN:—In compliance with the provisions of section 3 of an act relating to the Board of Health, the undersigned, a committee appointed by the said Board for the purpose, made on November 30th a sanitary inspection of the two schools under your charge. As we purposely avoided giving notice of the intended visit, the conditions found, we take it, fairly represent those usually prevailing.

The School for the White Blind.

As regards the more important sanitary features—general cleanliness, water supply and plumbing—we found the school in excellent condition. We think, however, that it would be an improvement of the lavatory in the southern wing of the girls' building to transpose the bath-tubs and water-closets. The latter are now located in a small inside room without an opening upon the outer air, and is consequently dark and not properly ventilated, while the bath-tubs occupy quarters that are both well-lighted and ventilated. It is much more important that the former should have the benefit of an abundance of light and air than the latter.

We noted the very small and totally inadequate inside play-room for the children in bad weather. For reasons given in the concluding paragraph, this is a defect which should be remedied. This could easily be done by utilizing the basement, which is now so much waste space, the only thing required being a good concrete floor. This would also be an improvement on general sanitary principles, inasmuch as it would prevent the rising of the ground air which, from the health standpoint, is objectionable.

The arrangements for the sick, we think, could be much improved. Each of the rooms in the two wings of the girls' building set apart for the cases of ordinary sickness are too far from the general lavatories. A bath-tub and water-closet should be installed in the immediate proximity of each of them. This need is too manifest to require further discussion. But the crying need of the institution is some provision for the proper isolation of contagious diseases, and we earnestly repeat the recommendation in regard to this matter made by the committee of inspection two years ago. The third floor in the center of the main building, being cut off from other parts, except a stairway from below, is well located for the purpose and could easily be transformed into two wards, one for each sex. This should be done by all means. The State cannot afford to subject the most pitiable and helpless of its wards to the dangers of an epidemic of infectious and therefore preventable disease.

The rooms on the west side of the girls' building are too dark. The number of windows is insufficient, and the trouble, especially on the second floor, is aggravated by the roof of the veranda. This defect should be remedied.

Leaving out other considerations, the blind, from a purely physical point of view, are heavily handicapped by their special infirmity. Except to a limited extent they are debarred from the active outdoor exercise which is so important to healthy childhood. They cannot romp and run and participate in athletic games, and in consequence they lack, as a class, the glow of vigorous health to be found in those blessed with sight. You have doubtless observed the pallor which generally characterizes them. For these reasons it is especially important that everything possible in the way of air and light and play-room should be provided for them.

The School for the Colored Deaf and Blind.

We found both departments of this school in a most exemplary state of cleanliness, and those in charge are deserving of commendation. Some of the water-closets are of a rather antiquated pattern, but are in good working order and answer the purpose very well. The school as a whole is in excellent sanitary condition.

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

SCHOOL FOR THE DEAF AND DUMB, AT MORGANTON.

BOARD OF DIRECTORS,

School for the Deaf and Dumb, Morganton, N. C.

GENTLEMEN:—Having made a sanitary inspection of your school, in compliance with the act relating to the Board of Health, the undersigned committee from said Board take pleasure in reporting that they found everything in excellent condition.

We would suggest, however, the advisability of changing the brick floor of the basement to one of concrete as soon as practicable. While not unsanitary, it is a source, we were informed, of much dust which finds its way to the floor above.

Very respectfully,

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

OXFORD ORPHAN ASYLUM.

BOARD OF DIRECTORS,

Oxford Orphan Asylum.

GENTLEMEN:—The committee from the State Board of Health visited the Oxford Asylum and made a careful investigation of the sanitary condition of the property under your charge. It affords us great pleasure to report that we found the buildings in excellent condition, so far as the sanitary arrangements were concerned. The cleanliness was so marked a feature as to excite our unstinted admiration. We nowhere found any evidence of neglect of the premises or want of daily care of all the property under the control of your Superintendent, Colonel W. J. Hicks, and his efficient helpers. The children bore the evidence of the well-directed care which is exercised over this institution.

We wish, however, to call your attention to two points which seem to us of marked importance: We found that everywhere the children were sleeping two in a bed, and it is with great earnestness that we advise you to separate these children, giving each one a single bed. This is a suggestion which is the result of long observation among those best fitted to judge of such necessities. Evil habits of pronounced character are often begotten in dormitories where two children sleep together. The presence of a bad child in a dormitory may work an amount of mischief which may be of serious detriment to the future lives of these little ones over whom you are otherwise exercising such beneficent care. We respectfully submit that the present air supply in these sleeping-rooms is hardly sufficient, and if possible, it would be well to scatter the children more. As we found it, the air supply was not over 255 cubic feet per head, being less than half of the minimum amount supposed to be necessary for the best health in sleeping-rooms. With the exception of the two above-named exceptions, this committee wishes to express again its great satisfaction at finding a charity of this sort so administered as to bring happiness and health to the inmates of the institution, and to insure among these helpless little ones, not only comfort during their stay, but a feeling of admiration, which is the outgrowth of gratitude, toward the institution which gave them an opportunity to become useful men and women.

Yours very truly,

G. G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

ASYLUM FOR COLORED ORPHANS.

BOARD OF DIRECTORS,

Colored Orphan Asylum, Oxford, N. C.

GENTLEMEN:—The committee from the State Board of Health visited this institution and found everything under the control of your Superintendent, Rev. Mr. Shepherd, well cared for. The house was clean and the children looked to be in good condition. Little or no sickness was reported, and there was every evidence of a thorough disposition to do the best for the inmates of the institution, under the care of the Superintendent and his corps of teachers and helpers. While it is not strictly a part of our inspection to look after the furniture in these buildings, we would respectfully recommend that these buildings be supplied with new bedsteads and mattresses, as they seem to be in bad shape.

Yours very truly,

G. G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

STATE HOSPITALS FOR THE INSANE.

CENTRAL HOSPITAL, AT RALEIGH.

THE BOARD OF DIRECTORS,

State Hospital for the Insane, Raleigh, N. C.

GENTLEMEN:—The undersigned, assigned by the State Board of Health to this work, have made a sanitary inspection of the hospital, and respectfully beg leave to report:

We found the institution clean and in excellent sanitary condition. We would note, however, two wants, the supply of which would, in our opinion, conduce to the healthfulness of the patients.

One of these is the want of verandas, enclosed, of course, with wire netting. Fresh air and sunshine in abundance are of the first importance, from the health point of view, to all persons, especially to children and invalids. The insane are below par in physical as well as mental health, and as the condition of many of them requires restraint of their liberty, they are debarred from outdoor exercise. Wire-enclosed verandas in good weather would in effect be outdoor wards and therefore of great benefit to many of the patients. We would recommend the constructions of such verandas on the west side of the hospital.

The other want is the lack of provision for the isolation of tuberculous patients. The transmissibility of tuberculosis is thoroughly established, the chief avenue of transmission being the sputum. The

proper care of the sputum in this class of patients is simply out of the question, and the danger of infection is, therefore, much greater than it would be among sane people. This is a crying need that should be met at once by the establishment of a special colony for the tuberculous, or by such other method as in the judgment of your honorable body would best solve the problem.

Very respectfully,

GEORGE G. THOMAS, M. D.,
RICHARD H. LEWIS, M. D.,
Committee.

STATE HOSPITAL, AT MORGANTON.

BOARD OF DIRECTORS,

State Hospital, Morganton, N. C.

GENTLEMEN:—The undersigned, representing the State Board of Health, having made a sanitary inspection of the Hospital, beg leave to report:

We found the institution in excellent sanitary condition. There is, however, in our judgment, a serious defect in the arrangements, and that is the lack of some provision for the isolation of the tuberculous patients. In view of the well-established fact of the communicability of the disease through the sputum and the manifest impossibility of securing its proper care from the irresponsible insane, it is particularly important that such provision should be made for them.

We were much pleased with the colony for men and believe this arrangement will be materially helpful to the general health and *ipso facto* to the special malady of its members. We would recommend the extension of this plan as far as possible.

Very respectfully,

GEORGE G. THOMAS, M. D.,
RICHARD H. LEWIS, M. D.,
Committee.

STATE HOSPITAL, AT GOLDSBORO.

To the BOARD OF DIRECTORS,

State Hospital, Goldsboro, N. C.

GENTLEMEN:—On October 27th, without previous notice to your Superintendent, we, a committee of the State Board of Health, made a sanitary inspection of the Hospital under your care. We respectfully beg leave to report as follows:

The economy and efficiency used in the management of the institution are unmistakable, as shown by the small annual per capita ex-

penditure, the valuable enlargement and improvement of plant in many respects, and the fairly low death-rate of the inmates as compared with that of other hospitals for the colored insane.

The arrangements for the preparation and preservation of food was found to be admirable; the newly added cold-storage, dancing-hall, dining-room, as well as other improvements, displayed wise and needful investments of the State funds.

The floors to the halls and most of the wards, made clean by frequent dry-sand scourings, and the walls made white by periodic applications of liquid lime, together with the remarkable absence of dust, gave evidence that neatness and cleanliness were conditions striven for by Dr. Miller and his subordinates.

While, therefore, the buildings and the management are in many respects a credit alike to them and the State, the sanitary condition is not ideal, is not above reasonable criticism.

The white floors, made of soft and inferior wood, certainly in the main building, are worn and rough in many places and further marred by large dirt-filled cracks.

With insane people for your population, such floors must sooner or later, in spite of all effort, become contaminated with feces, sputa, urine and other elements of filth.

Floors made of hard wood properly polished, and with periodic applications of enamel paint, would be well-nigh non-absorbent, easily washed and in every way more healthful.

Walls with smooth hard finish, properly painted, suited to disinfectant sprayings, washings and fumigation, are much to be preferred from a sanitary standpoint.

The mortality in your Hospital for the last twelve months, as we are informed, is a fraction less than 7 per cent., which is much lower than it was last year, and even lower than is usual among the colored insane of other asylums. While it is gratifying to know this, it is a fact sad to realize that *one preventable disease*—tuberculosis—is responsible for about 30 per cent. of this death rate. Two years ago our report showed quite 35 per cent. of your mortality was due to the same cause.

As is known, doubtless, to most if not all of you, tuberculosis is a contagious disease. As a contagion it is slow in its onset, and can, with proper precaution, be avoided even in close proximity with its victim. Its contagion is closely associated with the home, the hospital and the prison. An inclosure of some form is necessary to make it effective. "The house is the granary of the tubercle bacillus. It is the place in which tuberculous matter is kept vital until the bacillus can find a new host." The increasing susceptibility to consumption among the negroes of the South seems to be a well-established fact.

According to recent report, at the autopsies on all negroes dying in the Georgia Insane Asylum in 1901, over 50 per cent. gave unmistakable evidences of the presence of this disease.

The relation between *consumption* and *insanity* in the negro is, from the very nature of things, a question of much interest to your Board. The evidence at our command seems to point to the idea that insanity, in most instances, precedes the onset of consumption.

Granting the truthfulness of these propositions, the freest possible ventilation of the wards, with the greatest liberty to outdoor life, are matters of the highest concern to the well-being of your population.

Besides these precautions, we are assured by your Superintendent that systematic bichloride washings and formaldehyde fumigation is practiced in infected wards. To our minds, the most effective method left you whereby you may greatly diminish this heavy sacrifice of life is that of complete separation of the tubercular patients from the other inmates. Such a course was urged in our former report. We are glad to know that Dr. Miller, by means of a little profit realized from brick-making, has been enabled recently to effect such an arrangement among the female patients. There still remains several tubercular patients closely associated in every-day life with 217 male inmates. Surely our legislators will not longer remain indifferent to your needs for the proper removal of this evil condition.

With but a few exceptions, the defective closets in the sewerage system, to which your attention was called in a former report, have been replaced by splendid automatic flushing closets. The further expenditure of a very small sum will give an ideal condition on this line. When the filthy and mischievous habits of many of your inmates are remembered this becomes a matter of no little importance.

In our report of two years ago we called attention to imperfections in the water supply. As the same conditions prevail now as then, we again call attention to matters discussed in that report; except that we are informed by the management that the well near the stables continues to afford good water, as determined both by practical use and by occasional analyses. Two years more of use of this water with good results causes us to be less apprehensive of it, yet we regard it as a possible source of infection, and if used should be analyzed from time to time.

Respectfully,

FRANCIS DUFFY, M. D.,
J. L. NICHOLSON, M. D.,
Committee.

TUBERCULOSIS.

Tuberculosis, usually appearing in the pulmonary form and then popularly known as consumption, is the most fatal disease in North Carolina as it is in other parts of the civilized world. Since its organization the Board of Health has been working in a general way to prevent its spread, but no special concentrated effort to secure its prevention has been made until the present year. The Secretary of the Board, in his annual report made to the conjoint session of the Board with the State Medical Society at its meeting in Raleigh in May last, called particular attention to the importance of the subject and the difficulties appertaining to the solution of the problem, and earnestly requested of the physicians suggestions as to the best methods of procedure. The interested reader is referred to this report and the suggestions made in its discussions, which will be found on preceding pages.

The execution of the campaign was delegated to the Secretary, who gave it most careful consideration before taking action. The fundamental object to be obtained was the education of the people. The most effective way of reaching the people he believed to be through the family physician, whose immediate personal advice and influence would be worth all other agencies combined. For the purpose of this educational work a six-page pamphlet on "The Causes and Prevention of Consumption" was carefully prepared, special pains being taken to make it concise, yet essentially complete; positive and definite, yet plain and simple, and, notwithstanding the handicap, to make it, if possible, interesting. The pamphlet will be found below.

But the mere distribution of literature is not enough. A most important part of the problem is to secure the reading of it. To secure that end as far as possible by interesting the

recipient enough to get him to read the pamphlet, a series of letters addressed to different special classes of the people asking, in addition to the perusal of the article, the interested co-operation of the reader in securing its wide distribution and in general helping to stir up an interest in the subject, were prepared. A copy of these letters was and is to be mailed with each pamphlet, for the distribution is by no means finished, only about 25,000 having so far been sent out. The first was sent to all the newspapers in the State that it might be widely advertised. The response on the part of the editors was encouraging, and as a result much interest has been excited and the call for the pamphlet has been very gratifying, the demand not being limited to our own State, but extending from Indiana to Texas. The other letters are respectively to physicians, ministers, school-teachers of both races, managers of various enterprises having numbers of employees, and to the general public. The greatest interest in this work has so far been shown by ministers of the gospel, many undertaking to distribute the pamphlet by the hundred. In order to set forth fully the scheme adopted by the Board in its campaign against consumption, these letters are also printed below.

It will be noted that a special letter was prepared for the colored teachers. This was deemed necessary for the reason that consumption is much more fatal to the colored than to the white race, the death-rate, so far as our limited mortuary statistics show, being in the proportion of about two and a half to one. Besides, owing to their ignorance and poverty as a class, to their habits and environment and the difficulty of reaching them except through the leaders among their own people, special efforts in their behalf are required. In fact, the colored element in our population greatly enhances the difficulties of successfully solving this, the most stupendous task, under the most favorable circumstances, which confronts the sanitarian. It is our hope, however, that something can

be done through the physicians, ministers and teachers of their race.

It is not the intention of the Board to limit its efforts against tuberculosis to this method, but as far as possible to avail itself of others that are useful, such as the organization of anti-tuberculosis societies in our cities and towns, the securing of public addresses on the subject, and when it becomes feasible the establishment of a special sanatorium for consumption. These latter methods, while helpful, are necessarily very limited in their scope, but by the free use of printer's ink and postage stamps we hope at comparatively small expense to plant the seed of knowledge of this subject in every neighborhood in the State, in the confident belief that it will bring forth fruit.

But after all is said, the family physician remains the most effective agency in the solution of the problem, and by repeated appeals directly to every individual practitioner in the State we hope to arouse and keep alive his interest and secure his active co-operation.

CAUSES AND PREVENTION OF CONSUMPTION.

(Tuberculosis, Phthisis, Pulmonary Consumption).

Pulmonary tuberculosis (consumption) is the most common form of tuberculosis, about 95.5 per cent. of all kinds, it is said. The other principal forms of tuberculosis are scrofula (of the glands), white swelling (of the bones and joints), and lupus (of the skin). These are milder in character, and not so dangerous as the pulmonary form.

Consumption is the most fatal of all diseases and is aptly called "The Great White Plague." It is estimated that one-seventh of all deaths from every cause in the civilized world are due to it. One-fourth of all who die in adult life—the most useful period—it is said, are the victims of this disease. In North Carolina, according to the last census report, about one-tenth of all deaths were attributed to consumption. In other words, between four and five thousand of our people die every year of a disease *that can be prevented*.

CAUSES.

It is a communicable disease, which means that it is transmitted from one case to another. The essential element in the transmission is a germ known as the *tubercle bacillus*, an extremely minute rod-like body, one-ten-thousandth of an inch long and one-fifty-thousandth of an inch in thickness. In common with all communicable diseases, it is a *preventable disease*.

The causes of consumption are of two classes, predisposing and exciting.

Predisposing Causes.—In every constitution there is, in varying degrees, a certain power of resistance to the inroads of disease germs, most pronounced in those in vigorous health. While it may be said that the disease itself is very rarely if ever inherited, the lack of this resisting power, just as any other constitutional peculiarity, is inherited, hence the great susceptibility of those belonging to consumptive families. This is greatly increased by intermarriage between such, which should not occur. But resistance is weakened by lowered vitality from any cause, as insufficient and impure air from overcrowding, especially in dark, damp, sunless, poorly ventilated apartments; insufficient or improper food; other diseases of a wasting character, as dyspepsia and typhoid fever, for example; overwork, worry, dissipation, etc. It is a mistaken notion that alcohol is a preventive or curative of consumption. The habitual user is an easier victim. As about three-fourths of the nourishment of the body is furnished by the oxygen taken in with the air breathed, a deformed or imperfectly developed chest, with the corresponding deficiency of lung expansion, is a predisposing cause. For the same reason, those having normal chests but who do not expand them by exercise in the open air are more susceptible. The improved general health of the people resulting from the advance in hygiene, and the outdoor life that has come to be largely the vogue in recent years, is doubtless to no small degree responsible for the marked reduction in the death-rate from consumption.

Exciting Cause.—The Tubercle Bacillus. This is found, with the exception of infected meat and milk, which we believe to be rare so far in our State, only in the pus or matter thrown off by a tuberculous patient in the sputum or spit from the diseased lungs, or discharged in the other forms of tuberculosis. It is said that the number of the bacilli or germs thrown off in twenty-four hours in the advanced stage mount up sometimes into the billions. The sputum, therefore, is the chief source of the poison, and consequently its management is the most important item in the problem of the prevention of consumption. Although the germs may find their way into the system by being swallowed in infected food, tuberculous milk or meat, or eatables over which flies fresh from sputum have crawled, from kissing a consumptive on the lips, by putting infected articles in the mouth.

as for example, coins that have been handled by a consumptive, etc., they are generally taken in with the breath in the form of dust. As long as the spit remains moist it is innocent in this regard, as the germs cannot be dislodged and floated into the air. For the same reason the breath of a consumptive is not dangerous, but the germs are sometimes found in the fine spray of saliva expelled to a distance of several feet in coughing, sneezing, loud talking and laughing. The germs cannot live for any length of time exposed to sunshine, fresh air, and rain. They retain their vitality sometimes for months when protected from these agencies. Consumption is therefore essentially a *house disease*. In a room occupied a large part of his time by a consumptive, the germs are not only more abundant but more persistent in action than elsewhere, and the darker and more badly ventilated the room the more so. Moreover, persons who live an indoor life are more susceptible.

PREVENTION.

From what has been said above, the following specific rules of conduct are deduced:

The sputum or spit of a consumptive should always be destroyed before it can dry and assume the form of dust. Indoors he should spit directly into the open fire, if there be one, or into a spittoon or spit-cup containing some disinfectant, 5 per cent. carbolic acid, 2 per cent. formaldehyde or one to two thousand corrosive sublimate. Plain water would be much better than nothing, as it would keep the sputum moist and for so long a time innocuous. The contents of the spittoon should be burned or buried and the vessel scalded with boiling water. Away from home, especially in public places of all kinds, he should religiously abstain from spitting on the floor or the sidewalk. He should always use some form of pocket spittoon, of which there are many varieties that can be obtained at a trifling cost, or expectorate upon pieces of rag or soft paper, which should be kept wrapped up in paraffin paper or other impervious material until they are burned. He should never spit into his handkerchief, lest the dry sputum be distributed in the air when he pulls it out.

Special care should be taken not to soil the hands, face or clothing with the sputum.

A consumptive should never cough, sneeze, talk loudly or laugh towards any one near at hand, but turn away his face, or hold his handkerchief in front of his mouth.

No consumptive should ever be kissed upon the lips—better not at all. Regard for the safety of his dear ones ought to make him refuse absolutely to be kissed.

Persons waiting upon consumptives should wash their hands frequently, always before eating. They should abstain from sharing

with them articles of food sent to their rooms. They should, of course, keep constantly in mind the rules of prevention.

The tuberculous patient should have his own toilet articles, tableware and linen, and no one else should use them. In cleansing them they should be boiled, or at least washed with boiling water.

His underclothes, night-clothes and bed-linen should never be mixed with the linen of the family, but immediately upon removal be dropped into a tub of water and kept wet until they can be boiled and washed.

His room should be as airy and bright with sunshine as possible, having a southern exposure when feasible. It should be kept thoroughly ventilated with at least one window open day and night, winter and summer. It should be simply furnished, without carpet, curtains, furniture upholstered in cloth of any kind—all dust-catchers, in short. It should never be swept or dusted, but wiped with a damp cloth, which should immediately afterwards be burned, boiled, or soaked in a disinfecting solution.

No one, if it can be avoided, should sleep in the same room with a consumptive, never in the same or another bed very close to his. Besides the risk of catching the disease, the second person would consume a large part of the oxygen of the air which he so much needs.

Children, who have a habit of handling everything and putting their fingers in their mouths, ought not to be allowed in the room. This applies with special force to the crawling age.

A room vacated by a consumptive should never be occupied by another until it has been disinfected. Renters ought to refuse to take a house in which such a patient has lived until this has been done. In cities the municipal authorities should require the immediate disinfection of every house from which one dead of consumption has been buried. It would be best for the city to have this done by its own officials trained in the work. In order to reach these cases every town should forbid the burial or removal of any corpse except upon the presentation of a death certificate stating the cause of death, signed by the attending physician. Progressive towns do this any way in order to make an accurate record of their vital statistics.

A consumptive house servant or dairy hand is a source of danger that can and should be avoided. It would work no hardship, for a different life would be better for the patient. This warning applies especially to the South, for the reason that the disease is very much more prevalent in the colored than in the white race.

The outer clothes of a consumptive and the woolen skirts of all women which have trailed over the floors of infected houses, of public halls, of street-cars and over the sidewalks should be brushed out-of-doors, and the brusher should avoid, as far as possible, inhaling the dust, always breathing through the nose. Dark petticoats, often

tucked or flounced at the bottom, which are never washed and which accumulate filth month after month, are very objectionable.

The danger from tuberculous meat is slight because the germs are killed in cooking, but it is much greater from milk which is taken raw, and which, besides, is more liable to infection. Milk from a cow with a diseased udder should never be used. Cities and towns ought to require of every dairyman selling milk to their people a license granted only upon the observation of the proper sanitary rules, including the tuberculin test, and revocable upon violation of these rules.

Every municipality should adopt and enforce an ordinance against spitting on the sidewalks and on the floors of public places.

Compulsory notification would be very helpful, especially in the case of the very poor.

It is the plain duty of every consumptive, to his loved ones and the public, once in possession of the facts above set forth, to observe all the precautions laid down, and of those intimately associated with him to see that he does it.

It is likewise the duty of every physician to see that these facts are impressed upon his consumptive patients and their families. The interested co-operation of the attending physician is by far the most important element in the solution of this difficult and dreadful problem. Without it comparatively little can be done, with it wonders can be accomplished.

It should be borne in mind that a consumptive taking the precautions above set forth in the management of his sputum is not at all a source of danger to others, and need not be avoided. It would be unnecessary cruelty to treat him like a leper. But his friends should see that he does take the precautions.

OFFICES AND SHOPS.

In business offices, shops, factories, or any other places where a number of persons are shut indoors together, the danger of infection is increased. The managers of such offices or factories, for their own protection as well as that of their employees, should see that the proper precautions are observed. Free ventilation should be had and a rigid anti-spitting rule should be enforced. Spittoons containing water under all circumstances, and a disinfectant if there be present a known case of consumption, should be provided and their invariable use insisted upon. Book-keepers should never moisten the finger to turn a page. The Michigan Board of Health reports twenty successive cases of consumption in one office in Detroit as originating from one case who had this habit. The germs were found on the leaves of the books. His successors picked them up and put them into their own mouths, or scattered them in the air as dust in turn-

name and address of the householder of those families in which consumption exists (in confidence), and I will mail one to each of them. Let me beg of you also to impress, by your own word of mouth, the importance of taking the precautions laid down. Your personal advice would be more weighty than any publication.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

TO MINISTERS.

REV. AND DEAR SIR:—I enclose herewith a pamphlet on "The Causes and Prevention of Consumption," published by the State Board of Health for wide distribution among the people, in the hope of staying, to some extent at least, the ravages of this the most fatal of our diseases. The problem is how to get it into the hands of the people, especially of consumptives and of families in which the disease is present. Next to the physician, the minister of the Gospel is in more immediate relation with the sick and suffering than any other. There are more than 2,500 ministers in the State. If we can secure their sympathetic co-operation in this work for humanity we believe that it will be most helpful. Ministers as a class are not only public-spirited citizens, but as a result of their holy calling their hearts are especially attuned and responsive to the cry of distress, physical as well as spiritual. We therefore believe that we can count on your help in this work, and we ask it. You can best render it by giving a copy of the pamphlet to all the consumptives in your congregation and by discussing the question with your people publicly and privately. Ignorance of the causes and of the proper methods of prevention is chiefly responsible for the spread of the disease. And how can the people hear without a preacher?

Upon receipt of a postal card stating the number you can use, I will send them to you with pleasure.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

TO WHITE TEACHERS.

To the Teacher:

The State Board of Health is making an effort to prevent, as far as possible, the ravages of pulmonary consumption—the most fatal of all diseases. The method adopted is the wide diffusion among the people of information as to the best way to do this. To that end a pamphlet, setting forth in a simple manner the proper course to be pursued, has been prepared, a copy of which I enclose.

The teacher, through the children, is in relation, more or less direct, with nearly all the people in his or her school-district and, by inquiry of the pupils, can ascertain the families in which there is a case of sickness characterized by a cough. Having done so, she could send a copy of the pamphlet to the family by the child. Will you not make this inquiry, and let me know on a postal card how many copies you can use? Upon its receipt I will mail them to you without cost, and will add as many more as you will distribute to those interested, whether sick or well.

In reading the pamphlet you will note that one of the most important things in the prevention of consumption is the building up of the general health, or in keeping strong and well. This requires an observance of the general laws of hygiene, the most important of which are indicated in the pamphlet.

Scrofula in its various forms is a mild form of tuberculosis. Pale, flabby, listless children with running nose or ears, or who breathe through the mouth, if not actually scrofulous, have a tendency to that disease or toward true consumption later in life. It is, therefore, especially important that such children should enjoy to the full fresh air, sunshine and simple but nutritious food. Outdoor sport should be encouraged for all children, and, therefore, every school should have its playgrounds.

You can assist in educating the people in regard to consumption by talking about what you have read in the pamphlet as well as by distributing it. Will you not lend your valuable aid to this most important work? Write me.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

TO COLORED TEACHERS.

To the Colored Teacher:

Pulmonary tuberculosis, or consumption, as it is commonly called, has come to be the bane of the colored race. It is the most fatal of all diseases to every race, but it is especially so among the colored people, being nearly three times as fatal to them as to the whites. It is, therefore, especially important to your people that every effort should be made to check the ravages of this dreadful disease. Being a contagious disease, it can be prevented by following carefully the directions which are fully set forth in the pamphlet on the subject issued by the State Board of Health, a copy of which I enclose.

In this matter the colored people, as a whole, can be reached only by the more enlightened of their own race. We must depend, therefore, upon their ministers and teachers, the number of colored physicians being quite limited. As you are in relation with the people

in your school district through their children, and doubtless have their confidence, you can be of great service in this work—by sending the pamphlet, by the children, to those who can read, and by telling the illiterate about it. It is desirable that all the people should possess the information contained in the pamphlet, but particularly those families in which there is a case of the disease. In repeating the instructions, I would suggest that you emphatically condemn the habit of sleeping with the head covered and, with even greater emphasis, dwell upon the vital importance of properly caring for the sputum, or spit. Carelessness and a want of cleanliness in relation to the expectoration is the chief cause of the spread of consumption.

I bespeak your cordial co-operation in this work of humanity. It carries with it no pecuniary reward, but the consciousness that you had been of service to your people would repay you. Make a careful estimate of the number of pamphlets you can use to advantage, notify me on a postal card, and I will mail them to you without cost.

Respectfully,

RICHARD H. LEWIS, M. D.,
Secretary.

TO THOSE CONTROLLING EMPLOYEES IN INDOOR PURSUITS.

DEAR SIR:—The State Board of Health is making a special effort to check as far as possible among our people the ravages of consumption, our most fatal disease.

I enclose a copy of a pamphlet on its causes and prevention and ask your careful reading of the same, especially of the paragraph addressed particularly to you. I also bespeak in the interest of yourself as well as of your employees your cordial co-operation in this work we are trying to do for humanity.

I would be pleased to send you as many copies as you will distribute.

Very truly yours,

RICHARD H. LEWIS, M. D.,
Secretary.

TO THE GENERAL READER.

MY DEAR SIR:—I enclose a copy of a pamphlet on "The Causes and Prevention of Consumption," which the Board of Health has prepared for general distribution, and ask you to read it. Having read it, we would thank you to hand it to some consumptive or to the head of some family in which the disease is present. We would also be pleased if you would discuss the subject with your associates, and in that way assist in spreading the information.

Tuberculosis is the most fatal of all diseases, and at the same time is preventable. The chief cause of its spread is ignorance of its cause and of the best methods of preventing it. The hope of the Board is to dispel this ignorance, in part at least, by sending out this pamphlet and by still wider distribution of the information it contains through the help of the newspapers and by word of mouth on the part of those who read it. Will you not aid us in this effort to save our people, as far as possible, from suffering and death?

We would be more than glad to send the pamphlet to any one desiring it. A postal card to the undersigned would represent the cost and trouble.

Yours very truly.

RICHARD H. LEWIS, M. D.,

Secretary.

UNCINARIASIS OR HOOK-WORM DISEASE.

Since our last report work new in character and valuable in results has been inaugurated and vigorously prosecuted, viz., a campaign against what is known as hook-worm disease. What are known as "dirt-eaters" are victims of this disease, abnormalities in appetite being one of the symptoms. This intestinal parasite, being a blood-sucker, we now know is the source of the trouble with those pale, flabby, listless people, especially children, we so often see in our country districts, and not so much soda-biscuit and fried meat as we once thought. It no doubt also explains in many instances those cases of anæmia and weakness among the young operatives in cotton mills about which so much has been said—the operatives coming from the country bringing the disease with them.

While the hook-worm has been known in Europe for about fifty years, it was not until 1902 that a species indigenous to the Southern section of this country was discovered and demonstrated by Dr. Charles Wardell Stiles, Chief of the Department of Zoology in the United States Public Health and Marine Hospital Service. The following is a summary of Dr. Stiles' report on the subject:

SUMMARY OF DR. STILES' REPORT.

Convinced from theoretical deductions that hook-worm disease (uncinariasis) must be more or less common in the South, a trip was made from Washington, D. C., to Ocala, Fla., stopping at penitentiaries, mines, farms, asylums, schools, and factories, and the fact was established that the chief anæmia of the Southern rural and districts is due to uncinariasis, while clay districts and cities are not favorable to the development of this disease.

In the Old World, hook-worm disease was probably known to the Egyptians nearly three thousand five hundred years ago, but its

cause was not understood until about the middle of the nineteenth century, when it was shown to be due to an intestinal parasite, *Agchylostoma duodenale*. Until 1893 no authentic cases of this disease were recognized as such in the United States, but between 1893 and 1902 about thirty-five cases were diagnosed. In 1902 it was shown that a distinct hook-worm, *Uncinaria americana*, infests man in this country, and this indicated very strongly that the disease must be present, although not generally recognized. It is now established that in addition to the few cases of Old World hook-worm disease imported into the United States, we have in the South an endemic uncinariasis due to a distinct cause, *Uncinaria americana*. This disease has been known for years in the South, and can be traced in medical writings as far back as 1808,* but its nature was not understood. Some cases have been confused with malaria, others have been attributed to dirt-eating.

The hook-worms are about half an inch long. They live in the small intestine, where they suck blood, produce minute hemorrhages, and in all probability also produce a substance which acts as a poison. They lay eggs, which cannot develop to maturity in the intestine. These ova escape with the fæces and hatch in about twenty-four hours; the young worm sheds its skin twice, and then is ready to infect man. Infection takes place through the mouth, either by the hands soiled with larvæ or by infected food. Infection through the drinking water may possibly occur. Finally, the larvæ may enter the body through the skin and eventually reach the small intestine.

Patients may be divided into light cases, in which the symptoms are very obscure; medium cases, in which the anæmia is more or less marked, and severe cases, represented by the dwarfed, edematous, anæmic dirt-eater. Infection occurs chiefly in rural sand districts. Above the frost line the symptoms are more severe in summer than in winter, and whites appear to be more severely affected than negroes. Persons who come in contact with damp earth are more commonly infected than others; so that the disease is found chiefly among farmers, miners, and brickmakers. Severe cases are more common in women and children than in men over twenty-five years of age. Uncinariasis is a disease which occurs in groups of cases, and if one case is found in a family the chances are that other members of the same family are infected.

The testimony of patients severely infected is unreliable. Recalling that any one or more symptoms may be absent or subject to variation, it may be noted that the period of incubation (at least before the malady can be diagnosed by finding the eggs) is from four to ten

*An article by Dr. Pitt, who says that "along the Roanoke River, N. C., malaria or dirt-eating prevails, mostly among poor white people and negroes and originates, in my opinion, from a deficiency of nourishment."—Ed.

weeks. Stages are not necessarily distinctly defined, but are described as (1) stage of purely local symptoms, corresponding to the light cases; (2) stage of simple anæmia, corresponding to the medium cases; and (3) dropsical stage, corresponding more or less to the severe cases. The duration of the disease after isolation from the source of infection has been traced for six years and seven months; how much longer infection will last is not established. If a patient is subject to cumulative infection, the disease may last five, ten, or even fifteen years, and in case of light infection perhaps longer.

External appearance.—In extreme cases there is a general lack of development; skin waxy white to yellow or tan; hair is found on the head, but is more or less absent from the body; breasts are undeveloped; nails white; external genitalia more or less rudimentary; face anxious, may be bloated; conjunctivæ pale; eyes more or less dry; pupil dilates readily; membranes pale according to the anæmia; teeth often irregular; tongue frequently marked with purple or brown spots; cervical pulsations prominent; thorax emaciated; heart-beats often visible; abdomen frequently with "pot-belly"; extremities emaciated, frequently edematous, and with wounds or ulcers of long standing.

Urine 1010 to 1015; in advanced cases albumen without casts; acid or alkaline.

- *Fæces* reddish brown, contain eggs, and may contain blood.

Circulatory system.—Anæmia pronounced, according to degree and duration of infection; blood watery, with decreased red blood corpuscles and with eosinophilia; "heart disease" very commonly complained of; hæmic murmurs present; pulse 80 to 132 per minute.

Temperature.—Subnormal, normal, or to 101° to 102° F.

Respiratory system.—Breathing may be difficult, slow, or increased to as high as 30.

Muscular system.—Emaciation and great physical weakness.

Digestive system.—Appetite poor to ravenous; abnormal appetite often developed for pickles, lemons, salt, coffee, sand, clay, etc.; pain in epigastrium; constipation or diarrhœa.

Nervous system.—Headache, dizziness, nervousness, mental lassitude, and stupidity.

Genital system.—Menstruation irregular or absent; if present, it occurs chiefly in winter; there is a marked tendency to abortion.

Diagnosis.—The safest plan is to make a microscopic examination of the fæces to find the eggs; or, if fæces are placed on white blotting paper, a blood-like stain will be noticed.

Treatment.—Thymol, or male fern (or ? calomel); iron and good food.

Prognosis.—Good, if patient is not too far gone at time of treatment.

Lethality.—Not yet determined.

Prevention.—Treat all cases found and dispose of fæces.

Economically, uncinariasis is very important. It keeps children from school, decreases capacity for both physical and mental labor, and is one of the most important factors in determining the present condition of the poorer whites of the sand and pine districts of the South.

The disease is carried from the farms to the cotton mills by the mill hands, but does not spread much in the mills; nevertheless, it causes a considerable amount of anæmia among the operatives.

For the details of the work done by the Board in connection with this disease the reader is referred to the annual report of the Secretary made to the conjoint session of the Board of Health with the State Medical Society in 1904, and to the files of the *Monthly Bulletin*.

SMALLPOX.

For the past biennial period smallpox has been much more prevalent in the State than at any time since it made its first appearance in January, 1898. In the annual report of the Secretary of the Board for 1902-'03 a tabulated statement giving the number of counties infected, the number of cases and number of deaths according to race from the beginning to May 1, 1903, will be found. In the corresponding report for 1903-'04 similar statistics for that year are given, the total number of cases being 5,370—2,840 white and 2,530 colored—with total deaths 69:35 and 34 respectively, according to race. Previous to this year the number of cases was much larger among the negroes and for the first time this proportion was reversed. From January 12, 1898, to May 1, 1904, there have been reported 17,105 cases with 400 deaths—among the whites, 6,740 cases with 172 deaths, and among the colored people 10,365 cases with 228 deaths.

The explanation of the practical difficulty in controlling the disease is to be found in its extreme mildness, which, together with a pronounced prejudice against vaccination among the more ignorant of the population, creates a public sentiment strongly hostile to those thorough and drastic measures which are essential to its successful control and final obliteration from the State. In view of the above facts the present outlook is for a continuance of smallpox for years to come, or until all the people have either had it or been vaccinated.

The health officers of the State having become more familiar with the disease, the demand for the State Smallpox Inspectors has greatly diminished. During the two years Dr. Harrill for the western section has visited only eight

counties, viz., Buncombe, Stanly, Richmond, Ashe, Wilkes, Anson, Catawba and Caldwell; and Dr. Tayloe for the eastern section, nine, viz., Vance, Columbus, Pender, Greene, Pitt, Onslow, Camden, Beaufort and Hyde.

For details the reader is referred to the annual reports of the Secretary to the conjoint session, to be found on preceding pages.

LEGISLATION.

Two important measures having in view the better protection of the public health were enacted by the General Assembly of 1903. These were "An Act to Define the Practice of Medicine and Surgery," and "An Act to Protect Water Supplies."

The object of the former was to eliminate charlatanism of all kinds by requiring all persons offering to heal disease by any method whatsoever to prove to the satisfaction of the State by obtaining from its Board of Medical Examiners a license, thereby showing that they had acquainted themselves with the structure, functions and diseases of the human body and with those methods of healing generally accepted as the best. While materially weakened by an amendment exempting Christian Scientists, it covered all other forms of quackery. Unfortunately, however, the Supreme Court in *State v. Biggs*, declared it unconstitutional.

The act to protect water supplies was an amplification and improvement in many respects on an act under the same title passed by the Legislature of 1901, which it repealed. The provision empowering the State Board of Health to have the biological analyses required made in its own laboratory and to charge therefor "the sum of five dollars (\$5) for each examination," has resulted in a much closer surveillance of the public water supplies than ever before, and has at the same time enabled the laboratory, with the assistance of the Agricultural Department, to keep afloat and do much valuable work. A few of the water companies have shown a disposition to evade the law or payment for the work, and an amendment to cure this trouble would be of material benefit.

In its report to the American Public Health Association at the 1901 meeting the Committee on Water Legislation placed

North Carolina with only three other States in the first class; and as the act of 1903 is a very great improvement upon former statutes, her position in that rank would seem to be assured.

The following is the act:

AN ACT TO PROTECT WATER SUPPLIES.

The General Assembly of North Carolina do enact:

SECTION 1. In the interest of the public health every person, company, municipal corporation or agency thereof selling water to the public for drinking and household purposes, shall take every reasonable precaution to protect from contamination and assure the healthfulness of such water; and any provisions in any charters heretofore granted to such persons, companies or municipal corporations in conflict with the provisions of this act are hereby repealed.

SEC. 2. Such water-works as derive their supply from lakes or ponds or from small streams not more than fifteen miles in length shall have made a sanitary inspection of the entire water-shed not less, under any circumstances, than once every three calendar months, and a sanitary inspection of any particular locality on said water-shed at least once in each calendar month, whenever in the opinion of the board of health of the city or town to which the water is supplied, or when there is no such local board of health, in the opinion of the county superintendent of health, or in the opinion of the State Board of Health, there is reason to apprehend the infection of the water in that particular locality. Said companies or municipal corporations shall cause to be made a sanitary inspection of any particular locality on said water-shed at least once in each week, whenever in the opinion of the board of health of the city or town to which the water is supplied, or when there is no such local board of health, in the opinion of the county superintendent of health, or in the opinion of the State Board of Health, there is special reason to apprehend the infection of the water from that particular locality by the germs of typhoid fever or cholera. The inspection of the entire water-shed as herein provided for shall include a particular examination of the premises of every inhabited house on the water-shed, and in passing from house to house a general inspection for dead bodies of animals or accumulations of filth. It is not intended that the term "entire water-shed" shall include uninhabited fields and wooded tracts that are free from suspicion. The inspection shall be made by an employee of, and at the expense of, said water company or municipal corporation, in accordance with reasonable instructions as to method, to be furnished by the Secretary of the State Board of Health. The said sanitary inspector shall give in person to the head of each house-

hold on said water-shed, or in his absence to some member of said household, the necessary directions for the proper sanitary care of his premises. It shall further be the duty of said inspector to deliver to each family residing on the water-shed such literature on pertinent sanitary subjects as may be supplied him by the municipal health officer, or by the Secretary of the State Board of Health.

SEC. 3. In case of those companies obtaining their supply of water from rivers or large creeks, having a minimum daily flow of ten million gallons, the provisions of section 2 shall be applied to the 15 miles of water-shed draining into the said river or creek next above the in-take of the water-works.

SEC. 4. Every water company, whether owned by private individuals or corporations, or by the municipality, shall have made, not less frequently than once in every three months, at its own expense, by the chemist of the State Board of Health, or such chemist as the said board may designate, a chemical analysis; and once every month at its own expense by the Biologist of the State Board of Health or such biologist as said board may designate, a bacteriological examination of a sample of its water drawn from a faucet used for drinking purposes, packed and shipped in accordance with the instructions to be furnished by the Secretary of the State Board of Health: *Provided*, that when the supply is from a flowing artesian well said analysis shall be made in the discretion of the Secretary of the State Board of Health.

SEC. 5. Failure on the part of any water company to comply with the requirements of sections 2, 3, and 4 shall be punished by a deduction from any charges for water against the city or town supplied, of twenty-five dollars for each and every such failure: *Provided*, that in no one year shall the sum of such forfeitures exceed five hundred dollars. Where the water-works are owned or operated by the city or town, failure on the part of the municipal official having in charge the management of the water-works, to comply as above, shall be a misdemeanor, and punishable by a fine of not less than ten nor more than twenty-five dollars, or by imprisonment for not less than ten nor more than thirty days: *Provided further*, the said official does not prove to the satisfaction of the court that in spite of reasonable effort and diligence on his part he was prevented, directly or indirectly, by his superiors from doing his duty in this respect, in which case said superior officer or officers shall be deemed guilty of a misdemeanor, and punished by a fine of not less than fifty nor more than two hundred dollars, or by imprisonment for not less than one nor more than six months.

SEC. 6. Every city or town having a public water supply shall, at its own expense, have made at least once in every three months by one of its own officials a sanitary inspection of the entire water-shed of its water supply, and it shall be the duty of the said official making such inspection to report to the mayor any violation of this act.

SEC. 7. Every person, firm or corporation residing or owning property on the water-shed of a lake, pond or stream from which a public drinking supply is obtained, shall carry out such reasonable instructions as may be furnished him in the manner set forth in section 2, or directly by the municipal health officer, or by the State Board of Health. Failure to do so shall be deemed a misdemeanor, and shall be punishable by a fine of not less than two dollars and costs nor more than twenty-five dollars and costs, or by imprisonment for not less than ten nor more than thirty days.

SEC. 8. The mayor of each city or town having a public water supply shall have concurrent jurisdiction with any justice of the peace to hear and determine all violations of this act: *Provided*, such violation is within the jurisdiction of the justice of the peace.

SEC. 9. As a check and guarantee of the faithful performance of the requirements laid down in the preceding sections of this act, the State Board of Health shall make or have made by its authorized agents such inspections of water-sheds and such chemical and bacteriological examinations of the public water supplies of the State as may be deemed necessary to insure their purity. Should this inspection or examination show conditions dangerous to the public health, the Secretary of the said State Board of Health shall notify the mayor, the municipal health officer and the superintendent or manager of the water-works at fault, and demand the immediate removal of said dangerous conditions. If at the end of thirty days after the service of said notice and demand, the said dangerous conditions have not been removed, to the extent that due diligence could accomplish such removal, the said Secretary shall have printed in one or more of the local newspapers a plain statement of the facts for the information and protection of the citizens using the water.

SEC. 10. Each sanitary inspector herein provided for is hereby authorized and empowered to enter upon any premises and into any building upon his respective water-shed for the purpose of making the inspection herein required.

SEC. 11. Whoever defiles, corrupts, pollutes any well, spring, drain, branch, brook or creek, or other source of public water supply used for drinking purposes, in any manner, or deposits the body of any dead animal on the water-shed of any such water supply, or allows the same to remain thereon unless the same is buried with at least two feet cover, shall be guilty of a misdemeanor, and fined and imprisoned in the discretion of the court.

SEC. 12. Whoever shall collect and deposit human *excreta* on the water-shed of any public water supply shall be guilty of a misdemeanor, and punished by fine and imprisonment in the discretion of the court.

SEC. 13. No person, firm, corporation or municipality shall flow or discharge sewage into any drain, brook, creek or river from which a public drinking-water supply is taken, unless the same shall have

been passed through some well known system of sewage purification approved by the State Board of Health. Any person, firm, corporation or the officer of any municipality having this work in charge, who shall violate this section shall be guilty of a misdemeanor, and the continued flow and discharge of such sewage may be enjoined by any person.

SEC. 14. That all schools, hamlets, villages, towns or industrial settlements which are now located, or may be hereafter located on the shed of any public water supply, not provided with a sewerage system, shall provide and maintain a tub system for collecting human excrement, and provide for the removal of the same from the watershed at least twice each week. Every person, firm, corporation or municipality violating this section shall be guilty of a misdemeanor, and fined or imprisoned in the discretion of the court.

SEC. 15. No burying-ground or cemetery shall be established on the watershed of any public water supply nearer than five hundred yards of the source of supply.

SEC. 16. All water companies now organized under the State laws, which may maintain public water supplies may acquire, by condemnation, such lands and rights in land and water as are necessary for the successful operation and protection of their plants, said proceedings to be the same as prescribed by chapter 49, section 1 of The Code of North Carolina.

SEC. 17. For carrying out the provisions of this act the State Board of Health is authorized and empowered to have the bacteriological examinations made as hereinbefore provided for, and to charge for the same the sum of five dollars (\$5) for each examination.

SEC. 18. All laws and parts of laws in conflict with this act are hereby repealed.

SEC. 19. That this act shall be in force from and after its ratification.

THE MONTHLY BULLETIN.

The Monthly Bulletin continues to be our most valuable means of reaching the people, and especially the medical profession. Every physician is, or should be, in a certain sense, a health officer to his own *clientele*, and our principal method of educating the public in hygiene is through him. The word of the family physician is far more weighty with those whose confidence he possesses and with whom he comes in frequent personal communication on all questions relating to health than anything said or written by a stranger. In order, therefore, to keep in touch with him and to keep alive his interest and secure his co-operation, the *Bulletin* is sent regularly to all the physicians in the State.

In addition to a monthly review of the diseases prevalent in the State and the mortuary statistics of the principal cities and towns, leading articles by the Secretary of the Board, who is its editor, including as occasion demands, direct communications to physicians, and from time to time by the bacteriologist, as well as selected articles on pertinent subjects, are printed. The following titles will give an idea of the scope of its work: Plague Conference, Biological Laboratories and Public Health, A Bill to be Entitled an Act to Define the Practice of Medicine and Surgery, Recent Legislation, An Act to Protect Water Supplies, The Medical License Law as Amended, Notice to Physicians, Germs and Germicides, Annual Meeting of the Board of Health and of the State Medical Society, Report of the Secretary of the North Carolina Board of Health, June 1, 1902, to June 1, 1903; Hook-worm Disease, the Hook-worm Disease in Alabama, Laboratory Notes, The Fly as a Carrier of Typhoid Fever, Consumption is Chiefly Caused by the Filthy Habit of Spitting, The Domestic Filter,

Diphtheria, Extracts from the Evidence for Antitoxin, Wanted a Physician, A Case of Uncinariasis (illustrated), A New Course in General Hygiene Offered at the University, Our Medical License Law, Brief of the Attorney-General in State v. Biggs, Amendment to Medical License Law Unconstitutional, The Health Conscience—Pneumonia, The Relation of Early Diagnosis and Treatment to the Prevention of Tuberculosis, Antitoxin Again, The Adulteration of Foods and Medicines, The War Against Mosquitoes—An Appeal to Physicians, Hook-worm Disease Again, The Ethics of Eating, The Disinfection of Paper Money, Notice to Physicians, Annual Meeting of the State Medical Society and of the Board of Health, Dr. Ernest P. Foster, Dr. Abner Alexander, The Etiology of Malaria (illustrated), House Infection of Tuberculosis, Annual Report of the Secretary of the North Carolina Board of Health—1903-1904, Microbes and the Milk Supply, Compulsory Notification of Tuberculosis, The Prevention of Tuberculosis, Typhoid Fever and Drinking-water, Diphtheria, Woman's Duty Toward the Health of the Nation, A Scheme to Induce General Vaccination, The Germs of Consumption.

ARTICLES FOR THE PRESS.

The following articles were sent to all the newspapers of the State with request to print:

TYPHOID FEVER—RULES FOR ITS PREVENTION.

(Issued by the North Carolina Board of Health).

The active agency in the causation of typhoid fever is a bacterium, the bacillus typhosus, which attacks and causes the ulceration of certain glands in the small intestine, developing therein by myriads. They are therefore to be found chiefly in the bowel discharges, although present also in the excretion of the kidneys and to some extent in the expectoration of a person sick with the disease. From one of these sources, nearly always the first named, the bacteria are transferred to the intestinal tract of a healthy person. The poison is always swallowed. The most common agencies of transfer are the drinking water, including milk infected from washing cans in polluted water, and the common house-fly, although it may be conveyed directly to the nurse by her own soiled hands, and sometimes in dust. The most important rules therefore for the prevention of the extension of the disease may be briefly stated as follows:

1. Cover *immediately* upon their passage the body discharges, to prevent access of flies.

2. As soon as possible thoroughly disinfect the discharges by mixing in equal quantity with them one of the following: (a) freshly-made milk of lime or "whitewash" (unslaked lime); (b) a five-per-cent. solution of carbolic acid; (c) a 1-to-1,000 solution of corrosive sublimate; (d) a 1-per-cent. solution of formaldehyde. After standing a half hour (covered all the time), the mixture should be *buried* (never thrown on the surface of the ground) at a distance from the well of not less than 150 feet.

3. Provide in the sick-room a wooden tub one-third full of either of the three last-named solutions, and drop therein as soon as removed everything in the way of body or bed clothing, handkerchiefs, towels, etc., that have come in contact with the patient, and keep them submerged until they be *boiled*, washed and dried in the sun.

4. All remnants of food that may for any reason be carried into the sick-room must be burned.

5. The nurse should wash her hands and dip them into one of the solutions, preferably corrosive sublimate, after every "changing" of the patient. She should never draw water from the family well un-

less a pump is used. In case it should be absolutely necessary she should disinfect her hands as above before doing so.

6. The soiled linen of the patient should never be washed at or near the well or spring. The greatest care should be observed to prevent the drainage or seepage through the soil into the well or spring from accumulations of filth of all kinds. As soon as a case of typhoid fever appears in a family all drinking water should be boiled until a report on the same can be obtained from the State Biologist, the family physician making application to the Secretary of the Board of Health for permit and sterilized bottle.

7. As the germ is present in the intestine in the preliminary stages and for several weeks after convalescence is established and the patient practically well, extra care of surface privies should be observed. Every evacuation should be immediately and completely covered with lime or dry powdered earth.

Summary.—Prompt disinfection of all discharges from the body of the patient; protection of the same against flies; special care as to the drinking water; scrupulous cleanliness.

To the Profession.—As the people cannot be reached except through the medical attendant, we earnestly beg all physicians having cases of typhoid fever under their care to insist upon the strict observance of the above simple rules. Printed copies of the same will be furnished in quantity upon request.

MOSQUITOES AND MALARIA.

The most prevalent disease in North Carolina, certainly from now until frost, is malarial fever in one form or another. It is by no means confined to the low-lying Eastern section of the State, but is quite abundant in many localities in the hill country, having been reported even from Cherokee.

By recent scientific investigations the cause of the fever has been shown to be a microscopic animal known as the *plasmodium malariae* or *hem-amæba vivax*, which feeds upon the red corpuscles of the blood—hence the pallor of persons suffering from chronic malaria. The development of this little parasite in the blood is as follows: One of the spores, or baby germs, so to speak, enters a red corpuscle and, feeding on its contents, grows until at the end of twenty-four hours it has become nearly as large as the corpuscle. It then, by a process known as segmentation, splits up into a dozen or more little spores again, which for a short time are free in the blood and unattached to the corpuscles. It is just as the segmentation occurs that the chill comes on, which explains the periodic recurrence of the chill every twenty-four hours, and as it has been found that quinine is most effective in killing the germs while they are free in the blood and not buried in the substance of the corpuscles, the best time to give quinine is just before the chill is expected.

The method of the introduction of the malarial poison, the plasmodium, certainly the chief method, has been demonstrated beyond all question to be the sting of a certain variety of mosquito known as anopheles, the common mosquito, which while more abundant is innocent as a carrier of disease, being known as culex. The latter species will breed in still water of any kind, no matter how pure, but the former, our enemy, will only breed in stagnant pools in which there is a certain amount of vegetable matter, especially if there are no fish, such as top minnows or sun-perch, which feed upon the larvæ or wiggletails. This explains the fact that malaria is much more abundant after freshets, in the course of which the stream, getting out of its banks, washes holes in the ground—and, speedily falling, leaves there stagnant pools with few or no fish in them. Mosquitoes are very much more abundant this exceptional year of freshets than usual. It also explains the danger of brick holes.

The larvæ, or wiggletails, as we generally call them, are the young mosquitoes. Although they live in the water from the time they are hatched from the eggs which were laid on the surface until they reach maturity, they cannot live without air—they must breathe. Contrary to the general rule, they breathe “wrong end foremost”—through a long breathing tube which springs from the body near the tail and which they stick out of the top of the water when they want air. The bearing of this arrangement on their destruction will appear later.

There is a popular misapprehension in regard to the movement of mosquitoes. The general impression is that they are carried by the wind, and people at the sea-side say that a land breeze brings mosquitoes. It is a fact that they are more abundant when the breeze is from the land or in a calm, but according to those who know best the fact probably is not that they are blown from the swamps to landward, but that they simply come out again from the trees and shrubbery and the lea side of houses where they had taken refuge from the strong sea breeze which was too rough for their fragile bodies. With rare exceptions they travel, it is said, seldom more than a mile, and generally not so far. When one is troubled with mosquitoes a careful search will almost always reveal stagnant water in the near vicinity. The destruction of mosquitoes and the consequent prevention of malaria is accomplished in two ways: First and best, by the thorough drainage of all stagnant pools of water, and second, by keeping the surface of such pools covered with petroleum, what is known as light fuel oil, or even the crude petroleum being better and cheaper than ordinary kerosene. The film of oil prevents the larvæ from breathing and smothers them. The quantity necessary is one ounce or two tablespoonfuls to every fifteen square feet of surface, repeated every two weeks. This oil method was employed with great success last year by the city of Winchester, Va., and our own town of Tarboro has recently shown a most commendable spirit of enter-

prise in adopting it. Some care and a little expense in securing protection against mosquitoes and in providing a supply of pure drinking water will practically insure against malaria.

To those interested in this subject I cordially commend a very interesting and valuable book on mosquitoes written in popular and entertaining style by Dr. L. O. Howard, the Chief Entomologist of the United States, and published by McClure, Phillips & Co., New York, at a cost of \$1.64, postpaid.

RICHARD H. LEWIS, M. D.,
Secretary State Board of Health.

VITAL STATISTICS.

As explained in previous reports, our vital statistics are necessarily partial and incomplete owing to the general character of our population, it being chiefly rural, with one-third of the whole negroes. We have made no attempt, therefore, to collect vital statistics except from cities and towns.

In 1903 twenty-seven cities and towns with an aggregate population of 155,700—91,250 white and 64,450 colored—reported, the average death-rate being 18.3 per thousand, 14.3 for the whites and 23.9 for the colored race.

In 1904 twenty-eight, with an aggregate population of 173,300—101,700 white, 71,600 colored—reported. The total death-rate was 20.0, 15.2 for the whites and 26.9 for the colored.

In round numbers the death-rate for the colored race was about ten per thousand more than for the white race. Whether this means that the increase of the colored population is slower than that of the white, it is impossible to say, because we have no record of births. Our impression, however, in the absence of complete and reliable records, is that the negroes are more prolific than the whites, and therefore in all probability the proportion between the races remains about the same, at least so far as natural increase is concerned.

The scourge of the colored race remains tuberculosis, the death-rate from this disease during the past two years being: In 1903, for the whites, one in 10.26 of all deaths, or 1 to 710 of the population; for the colored, one in 6.46, or 1 to 270. In 1904 it remained much the same: for the whites, 1 in 9.46 of all deaths, or 1 to every 624 of the population; for the colored, 1 in 6.31 and 1 to 234 respectively. To put it in another way: the death-rate from consumption in the

two races is as 1 is to 2.6. With slight variation this proportion has been quite constant for years.

During the present biennial period, 1903-'04, there has been a material decrease in the death-rate from both typhoid and malarial fevers in both races, the latter, however, being proportionately much more fatal to the colored race than the white. In previous reports we have attempted to explain this fact, which is contrary to the usually accepted theory that the negro is less susceptible to malaria than the white man.

For details the reader is respectfully referred to the tables which follow:

TABLE I—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1903 AND 1904.

Eastern Division (E)—Alluvial Plain. Central Division (C)—Hilly. Western Division (W)—Mountainous. The figures under the various diseases represent in percentage the proportion of the counties reporting the presence of the disease in question to the whole number of counties sending reports for the month.

Month.	Physical Division.	Year.	Whole Number Counties.	Number Counties Reporting.	Diphtheria.	Diarrhoeal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Smallpox.
January.	E.	1903	36	33	18.2	0.0	21.2	18.2	3.0	9.1	18.2	9.1	39.3	18.2
		1904		27	18.5	0.0	37.0	3.7	0.0	0.0	14.8	0.0	11.1	29.6
	C.	1903	27	24	8.3	0.0	20.8	8.3	0.0	4.2	33.3	25.0	41.7	33.3
		1904		23	30.4	0.0	21.7	8.7	4.3	0.0	30.4	0.0	21.7	73.9
	W.	1903	34	31	12.9	0.0	0.0	0.0	0.0	0.0	19.3	25.8	25.8	51.6
		1904		29	23.1	3.8	11.6	3.8	0.0	0.0	34.6	0.0	23.1	53.8
February.	E.	1903	36	31	6.5	0.0	29.0	12.9	6.5	0.0	16.1	3.2	38.7	22.6
		1904		27	14.8	0.0	48.1	11.1	0.0	3.7	48.1	11.1	29.6	18.5
	C.	1903	27	25	0.0	0.0	32.0	12.0	4.0	4.0	28.0	16.0	28.0	44.0
		1904		24	20.8	0.0	41.7	0.0	0.0	0.0	41.7	20.8	20.8	75.0
	W.	1903	34	30	10.0	0.0	16.7	0.0	0.0	0.0	20.0	10.0	26.7	56.7
		1904		29	24.1	0.0	17.2	0.0	0.0	0.0	17.2	10.3	17.2	48.3
March.	E.	1903	36	34	14.7	2.9	17.6	14.7	0.0	5.9	14.7	2.9	41.2	2.9
		1904		29	13.8	0.0	17.2	13.8	0.0	3.4	31.0	0.0	24.1	24.1
	C.	1903	27	25	4.0	0.0	44.2	8.0	0.0	4.0	28.0	12.0	28.0	44.0
		1904		23	21.7	0.0	39.1	4.3	4.3	0.0	21.7	21.7	13.0	65.2
	W.	1903	34	30	6.6	0.0	3.3	3.3	0.0	0.0	13.3	16.7	23.3	73.3
		1904		30	16.7	0.0	26.1	0.0	0.0	0.0	13.3	13.3	20.0	50.0
April.	E.	1903	36	31	6.5	19.4	6.5	25.8	0.0	9.7	6.5	0.0	38.7	0.0
		1904		27	22.2	0.0	11.1	18.5	3.7	3.7	25.9	0.0	33.3	22.2
	C.	1903	27	25	8.0	8.0	28.0	12.0	0.0	0.0	12.0	12.0	32.0	56.0
		1904		21	19.0	0.0	23.8	9.5	4.7	0.0	9.5	19.0	23.8	71.4
	W.	1903	34	29	10.3	3.4	6.8	0.0	0.0	0.0	10.3	13.8	20.7	51.7
		1904		31	6.5	0.0	22.6	0.0	0.0	0.0	9.7	0.0	16.1	38.7
May.	E.	1903	36	31	6.5	41.9	6.5	22.6	0.0	3.2	0.0	0.0	48.4	6.5
		1904		25	12.0	44.0	4.0	28.0	8.0	0.0	12.0	4.0	36.0	20.0
	C.	1903	27	23	13.0	47.8	4.3	21.7	4.3	0.0	0.0	8.7	52.2	30.4
		1904		23	4.3	21.7	13.0	8.7	4.3	0.0	4.3	13.0	26.0	47.8
	W.	1903	34	28	0.0	42.8	3.6	0.0	0.0	0.0	0.0	7.1	25.0	39.3
		1904		29	13.8	17.2	13.8	0.0	0.0	0.0	6.8	3.4	17.2	41.4
June.	E.	1903	36	31	9.7	12.9	0.0	41.9	0.0	9.7	0.0	9.7	71.0	3.2
		1904		28	14.3	35.7	0.0	39.3	7.1	0.0	0.0	0.0	50.0	10.7
	C.	1903	27	24	0.0	16.7	4.2	29.2	4.2	0.0	4.2	4.2	83.3	33.3
		1904		23	17.3	39.1	0.0	21.7	0.0	0.0	0.0	21.7	65.2	39.1
	W.	1903	34	31	9.7	32.2	3.2	3.2	0.0	0.0	3.2	9.7	51.6	29.0
		1904		29	10.3	37.9	3.4	0.0	0.0	0.0	0.0	3.4	48.3	44.8
July.	E.	1903	36	32	6.2	15.6	0.0	53.1	9.3	9.3	0.0	3.1	81.2	15.6
		1904		32	9.3	18.7	0.0	43.7	6.2	0.0	0.0	3.1	78.1	12.5

TABLE I—Continued.

Average for the Year.	Month.	Physical Division.	Year.	Whole Number Counties.	Number Counties Reporting.	Diphtheria.	Diarrheal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Smallpox.
August.	July.	C.	1903 1904	27	23 24	0.0 16.7	8.7 16.7	0.0 0.0	21.7 25.0	0.0 4.2	0.0 0.0	0.0 0.0	8.7 16.7	91.3 91.7	21.7 29.2
	W.	1903 1904	34	31 29	9.7 10.3	12.9 27.6	0.0 0.0	9.7 0.0	6.5 0.0	0.0 0.0	0.0 0.0	12.9 0.0	80.6 89.6	29.0 24.1	
	E.	1903 1904	36	29 31	24.1 12.9	6.8 6.5	0.0 3.2	55.2 64.5	13.8 12.9	6.8 9.7	0.0 3.2	6.8 0.0	75.8 70.9	6.8 9.7	
	C.	1903 1904	27	25 24	16.0 20.8	0.0 8.3	0.0 0.0	32.0 20.8	0.0 0.0	0.0 0.0	0.0 8.3	12.0 16.6	80.0 91.7	12.0 16.5	
	W.	1903 1904	34	31 31	22.6 16.1	9.7 0.0	0.0 0.0	6.5 9.7	0.0 0.0	0.0 0.0	0.0 0.0	29.0 6.5	67.7 83.9	29.0 22.6	
	September.	E.	1903 1904	36	30 30	43.3 36.6	3.3 0.0	0.0 0.0	63.3 63.3	6.6 6.6	13.3 23.3	0.0 0.0	10.0 0.0	73.3 80.0	6.6 16.7
	C.	1903 1904	27	25 21	32.0 52.4	0.0 0.0	0.0 0.0	28.0 28.6	8.0 4.8	0.0 0.0	4.0 0.0	32.0 23.8	92.0 90.5	12.0 14.3	
	W.	1903 1904	34	30 26	30.0 30.8	0.0 0.0	3.3 0.0	3.3 15.4	0.0 0.0	0.0 0.0	3.3 3.8	23.3 23.1	63.3 81.5	20.0 26.9	
	October.	E.	1903 1904	36	30 28	26.6 60.7	10.0 0.0	0.0 0.0	60.0 57.1	13.3 7.1	10.0 28.6	0.0 3.6	6.6 3.6	66.6 64.3	6.6 17.9
	C.	1903 1904	27	24 24	33.3 54.2	0.0 0.0	8.3 12.5	29.2 20.8	4.2 20.8	8.3 0.0	12.5 4.2	29.2 20.8	70.8 87.5	25.0 25.0	
	W.	1903 1904	34	31 28	45.1 32.1	0.0 0.0	0.0 3.6	3.2 10.7	0.0 0.0	0.0 0.0	6.4 17.9	22.6 25.0	64.5 78.6	16.1 17.9	
	November.	E.	1903 1904	36	29 31	34.5 38.7	0.0 0.0	6.8 0.0	41.4 41.9	6.8 9.7	17.2 19.3	0.0 12.9	6.8 9.7	58.6 58.1	13.8 41.9
C.	1903 1904	27	24 22	33.3 54.5	0.0 0.0	12.5 4.5	0.0 18.2	0.0 0.0	0.0 9.1	0.0 0.0	12.5 18.2	41.7 31.8	58.3 77.6	33.3 40.9	
W.	1903 1904	34	31 29	29.0 37.9	0.0 0.0	6.5 3.4	6.5 0.0	0.0 0.0	0.0 0.0	16.1 20.7	16.1 24.1	58.1 62.1	25.8 34.5		
December.	E.	1903 1904	36	28 33	42.9 30.3	0.0 0.0	28.6 3.0	14.3 15.1	0.0 3.0	7.1 6.1	10.7 30.3	7.1 9.1	32.1 39.4	17.9 36.4	
C.	1903 1904	27	24 24	50.0 50.0	0.0 0.0	12.5 8.3	8.3 8.3	4.2 8.3	0.0 0.0	0.0 0.0	37.5 16.6	25.0 33.4	37.5 45.8	37.5 41.7	
W.	1903 1904	34	30 32	23.3 18.7	0.0 0.0	3.3 18.7	0.0 0.0	0.0 0.0	0.0 0.0	13.3 25.0	10.0 21.9	30.0 34.4	36.7 21.9		
Average for the Year.	1903	E. C. W.	36	30.7	20.0	9.4	7.9	35.3	4.9	8.4	5.5	4.6	55.4	10.0	
			27	24.2	16.6	6.8	13.9	17.5	2.4	1.7	13.9	18.9	57.9	32.2	
			34	30.2	17.4	8.4	3.9	3.0	0.5	0.0	8.8	16.4	44.8	39.7	
		E. C. W.	36	29.0	23.7	8.7	10.3	33.3	5.7	8.1	15.1	3.4	47.9	21.7	
			34	23.0	30.2	7.1	13.8	14.5	3.0	0.0	13.3	19.9	54.5	44.7	
			34	29.0	20.0	7.2	10.0	3.3	0.0	0.0	12.7	10.8	47.0	35.4	
1903 1904	State. State.	97	85.1	19.0	8.2	8.6	18.6	2.6	3.4	9.4	13.3	52.7	27.3		
		97	81.0	24.6	7.7	14.7	17.1	2.9	2.7	13.7	11.4	49.8	33.9		

TABLE II—SHOWING THE COMPARATIVE PREVALENCE OF DISEASE DURING THE YEARS 1903 AND 1904.

Disease.	Number of Counties that Mention the Presence of each Disease each Month.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Number of counties that sent in reports (97 counties in the State) -----	1903. 87	85	90	85	82	86	86	85	85	85	84	82
	1904. 76	80	82	79	77	80	85	86	77	80	82	89
Cholera (chicken) -----	1903. ---	2	1	1	3	---	2	2	---	1	2	---
	1904. ---	---	---	1	---	---	---	---	---	1	---	---
Cholera (hog) -----	1903. 2	2	1	---	3	---	9	6	7	10	7	5
	1904. 2	1	---	4	2	1	4	6	4	5	5	4
Diarrhoeal diseases -----	1903. ---	1	1	9	36	18	11	5	1	3	---	---
	1904. 1	---	---	---	21	30	18	4	---	---	---	---
Diphtheria -----	1903. 12	5	8	7	5	6	5	18	30	30	27	31
	1904. 18	16	13	12	8	11	10	15	30	39	34	29
Distemper (horses) -----	1903. ---	---	---	1	---	---	---	---	---	---	---	2
	1904. 2	2	2	3	1	---	---	---	---	---	---	1
Influenza -----	1903. 12	22	18	11	4	2	---	---	1	2	7	12
	1904. 18	28	22	15	8	1	---	1	---	4	2	7
Malarial fever -----	1903. 8	7	8	11	12	21	25	27	27	25	14	6
	1904. 4	3	5	8	9	16	22	28	29	24	17	5
Malarial fever, hemorrhagic -----	1903. 4	1	3	3	1	3	3	2	4	5	5	2
	1904. ---	1	1	1	---	---	---	3	7	8	6	2
Malarial fever, pernicious -----	1903. 1	3	---	---	1	1	5	4	4	5	2	1
	1904. 2	---	1	2	3	2	3	4	3	2	5	1
Measles -----	1903. 6	14	13	16	14	11	6	5	6	5	5	7
	1904. 18	27	31	32	32	23	14	14	8	13	13	13
Mumps -----	1903. 6	7	11	13	7	2	4	2	1	3	6	3
	1904. 4	5	5	8	6	3	1	3	2	---	2	2
Pneumonia -----	1903. 20	18	16	8	---	2	---	---	2	5	8	15
	1904. 20	28	18	12	6	---	---	3	1	7	14	22
Rabies (dogs) -----	1903. ---	1	---	---	---	---	---	---	---	---	---	---
	1904. ---	---	---	1	---	1	1	1	1	---	1	1
Rotheln -----	1903. ---	---	---	---	---	---	---	---	---	---	---	1
	1904. 2	---	1	2	---	---	---	---	---	---	---	---
Scarlatina -----	1903. 17	8	9	7	4	7	7	14	18	16	17	11
	1904. 8	11	9	4	5	6	5	6	11	13	17	17
Smallpox -----	1903. 31	35	34	29	20	18	19	15	11	13	20	25
	1904. 39	37	37	35	28	25	18	13	15	16	32	30
Staggers (horses) -----	1903. 6	1	---	---	---	---	---	---	---	---	---	---
	1904. ---	---	---	---	---	---	---	---	---	---	---	---
Typhoid fever -----	1903. 31	27	29	26	37	58	72	63	64	57	49	27
	1904. 14	18	16	19	20	43	73	70	64	61	53	35
Varicella -----	1903. 3	1	2	2	4	1	1	---	---	---	2	2
	1904. 1	4	3	3	---	---	---	---	1	1	2	1
Whooping-cough -----	1903. 21	20	27	25	22	27	35	22	22	19	18	21
	1904. 19	19	20	21	20	23	18	17	20	23	22	23

TABLE III—TABLE OF MORTALITY REPORTS FOR YEAR ENDING DECEMBER 31, 1903.

Towns and Reporters.	Races.	Deaths by Months, 1903.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.												
		Total.	Total.	Total.	Total.	Total.	Total.	Total.	Total.	Total.	Total.	Total.	Total.	By Races.	By Towns.	By Races.	By Towns.												
Asheville. Dr. C. V. Reynolds.	W.	9	6	10	4	5	6	7	8	6	3	75	108	18.5	9.0	15.0	6.0	7.5	7.5	9.0	10.5	12.0	9.0	4.5	9.3	8,000	13,000		
	C.	7	6	12	3	8	8	9	7	5	13	8	7	16.8	14.4	28.8	7.2	19.2	19.2	22.1	16.8	12.9	9.0	16.8	18.6	5,000	9,000		
Charlotte. Dr. F. O. Hawley.	W.	13	11	17	8	27	10	23	16	9	15	6	168	20.0	12.0	17.0	8.7	29.4	10.9	25.1	19.5	9.8	16.4	14.2	6.6	15.3	11,000	18,200	
	C.	12	8	10	12	17	13	13	14	14	8	20	155	14.2	13.3	16.7	20.0	28.3	21.7	21.7	23.3	32.3	33.3	33.3	32.1	17.7	7,200	11,000	
Durham. Dr. N. M. Johnson.	W.	9	11	8	7	8	12	14	17	20	13	17	162	13.5	16.5	12.0	10.5	12.0	18.0	22.5	53.0	19.5	52.1	7	24.0	19.0	8,000	13,000	
	C.	8	14	8	16	13	15	17	11	6	14	10	142	19.2	38.6	19.2	38.4	31.2	36.0	40.8	26.4	14.0	33.6	62.4	24.0	28.4	5,000	5,000	
Edenton. Dr. T. J. Hoskins.	W.	2	0	1	1	2	0	2	0	1	1	11	28	20.0	0.0	0.0	16.0	10.0	10.0	20.0	0.0	0.0	10.0	10.0	10.0	9.2	1,200	3,100	
	C.	3	3	1	0	2	0	2	1	2	1	17	20.0	20.0	6.7	0.0	13.3	0.0	13.3	6.3	12.6	6.3	8.9	9.0	9.2	1,900	3,100		
Fayetteville. Dr. John D. MacRae.	W.	0	2	0	1	3	0	1	2	3	7	2	23	0.0	9.6	0.0	9.6	4.8	14.4	0.0	4.8	9.6	14.4	33.6	9.6	9.2	2,500	4,800	
	C.	1	1	2	3	8	6	4	3	4	6	5	39	6.6	5.2	10.4	15.2	15.6	31.3	30.8	15.6	20.9	23.1	10.4	28.1	11.6	2,300	4,800	
Goldsboro. George E. Hood, Mayor. R. A. Creech, Health Officer.	W.	0	2	0	1	3	8	4	1	5	7	2	35	0.0	6.8	0.0	8.4	10.3	27.4	13.7	8.4	17.1	24.0	6.9	6.8	10.0	3,500	6,100	
	C.	6	4	3	6	7	6	4	11	15	7	1	76	27.7	18.5	13.8	27.7	27.7	32.8	27.7	18.5	5.60	8.69	28.2	4.6	28.2	18.2	2,600	6,100
Greensboro. John S. Michaux, City Clerk.	W.	1	3	7	7	12	7	6	8	5	2	16	82	2.0	5.9	13.8	13.8	23.6	13.8	11.8	15.7	15.7	9.8	3.9	31.5	13.4	6,100	10,100	
	C.	9	8	13	11	12	9	16	12	19	7	11	143	27.2	24.0	39.0	33.0	38.0	27.0	33.0	38.0	27.0	33.0	38.0	27.0	48.0	35.7	4,000	10,100
Henderson. Dr. John H. Tucker.	W.	3	2	1	0	1	2	3	0	1	4	2	19	17.1	11.4	5.7	0.0	5.7	11.4	20.6	0.0	0.0	5.7	22.8	11.4	9.0	2,100	3,800	
	C.	1	2	2	9	9	7	8	4	6	0	63	72	7.1	14.1	14.1	14.1	63.5	63.5	49.4	45.6	52.8	22.8	23.6	0.0	31.2	18.9	1,700	3,800
Laurinburg. Dr. A. W. Hamer. Dr. G. D. Everington.	W.	8	0	2	1	2	1	1	0	4	2	2	18	40.0	0.0	26.7	13.8	26.7	13.8	13.8	0.0	0.0	53.8	32.6	28.7	20.0	900	1,500	
	C.	1	2	0	1	1	1	0	1	0	2	9	27	20.0	40.0	0.0	0.0	20.0	20.0	20.0	0.0	0.0	0.0	0.0	40.0	15.0	18.0	600	1,500
Lenoir. Dr. A. A. Kent.	W.	1	2	3	1	2	0	1	2	1	0	2	0	15	10.0	20.0	30.0	10.0	20.0	10.0	20.0	10.0	0.0	0.0	0.0	12.5	12.0	1,200	1,500
	C.	0	0	0	0	0	0	0	0	0	1	2	0	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	1,200	1,500

TABLE III.—Continued.

Towns and Reporters.	Deaths by Months, 1903.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.	
	Races.												January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.		
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.																Total by Races.
Tarboro.	0	2	1	2	0	0	3	2	1	1	2	15	39	0	12	6	0	0	0	18	0	6	0	12	0	7.5	2,000	
Dr. William J. Thigpen.	3	1	1	1	0	2	2	4	0	5	24	24	72	24	24	24	0	0	0	48	0	96	0	0	120	48	15.6	500
Wadesboro.	2	0	0	1	0	1	0	2	1	3	13	25	24	0	0	0	12	0	0	12	0	0	24	0	24	0	13.0	1,000
Dr. J. H. Bennett.	0	0	1	3	2	1	1	1	0	2	12	0	0	0	17	15.1	4	34	3	17	17	1	0	0	34	37	14.7	700
Washington.	2	3	4	3	5	3	1	4	5	4	43	92	8	12	16	0	12	0	20	0	12	0	4	0	18	14	3	3,000
Dr. John G. Blount.	2	1	4	5	4	5	8	1	8	2	49	92	9	6	4	19	224	0	38	4	4	8	3	1	8	16	6	5,900
Dr. D. T. Tayloe.	2	2	1	0	0	3	1	2	2	1	3	20	24	0	24	0	0	0	36	0	36	0	12	0	36	20	18.5	1,300
Waynesville.	0	0	1	0	3	0	0	0	0	0	4	24	0	0	40	0	0	120	0	0	0	0	0	0	0	13	3	300
Dr. T. Stringfield, Mayor.	0	0	0	1	3	0	0	1	1	1	0	8	35	0	0	0	0	0	17	1	17	1	17	1	0	11	4	700
Weldon.	0	0	0	1	3	0	0	1	1	1	0	8	35	60	0	16	0	32	0	96	0	32	48	0	48	96	0	750
J. T. Gooch, Mayor.	4	1	0	2	2	6	2	3	3	2	27	15	6	12	20	4	25	37	1	284	0	25	6	224	0	19	2	10,000
Wilmington.	13	10	17	21	13	26	20	23	16	20	15	18	550	21	8	16	4	33	8	34	3	2	7	25	2	36	2	21,000
Dr. Charles T. Harper.	20	15	31	25	34	31	32	30	24	32	37	25	837	21	8	16	4	33	8	34	3	2	7	25	2	30	6	11,000
Wilson.	3	5	5	2	4	8	2	0	4	3	2	1	39	9	5	15	8	17	1	6	8	0	13	7	10	3	13	3,800
Dr. W. S. Anderson.	6	4	3	1	5	6	5	4	7	2	8	2	53	24	0	10	9	4	18	22	8	13	2	11	5	25	4	7,000

TABLE IV—TABLE OF MORTALITY REPORTS FOR YEAR ENDING DECEMBER 31, 1904.

Towns and Reporters.	Deaths by Months, 1904.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.						
	Races.												By Months.												By Races.								
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Towns.	By Races.																			
Asheville	W.	10	6	16	9	6	15	7	6	4	5	3	7	34	196	24	9.0	24.0	12.0	9.0	22.5	10.5	9.0	6.0	7.5	4.5	10.5	11.7	15.3	8,000	13,000		
Dr. C. V. Reynolds.	C.	10	5	8	6	9	6	9	18	11	7	8	11	3	106	196	24	12.0	19.2	24.0	14.4	24.0	4.3	22.6	4.1	16.8	19.2	22.6	7.2	22.1	5,000		
Charlotte	W.	8	9	9	14	8	35	8	13	8	10	10	14	145	296	25	9.8	9.8	15.3	8.7	78.2	8.7	71.4	2.8	7.1	14.2	10.9	10.9	13.2	11,000	18,200		
Dr. F. O. Hawley.	C.	15	12	16	8	16	11	18	15	11	13	11	5	151	296	25	20.0	26.7	13.3	32.6	7.7	38.0	22.5	3.1	18.3	32.1	7.1	16.9	8.3	32.1	7,200		
Durham	W.	8	16	11	6	7	22	13	16	21	4	19	8	151	337	12	24.0	16.5	9.0	10.5	53.3	19.5	24.0	31.5	6.0	23.5	12.0	18.9	25.9	8,000	13,000		
Dr. N. M. Johnson.	C.	18	12	20	10	14	12	18	17	23	13	21	8	196	337	41	28.8	48.0	24.0	38.3	62.8	8.4	2.3	26.0	5.5	23.1	2.6	4.9	28.7	2.2	5,000		
Edenton	W.	2	3	0	0	1	3	1	2	1	0	0	14	32	20	30.0	0.0	0.0	10.0	10.0	30.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	10.7	1,200	3,000	
Dr. Thomas J. Hoskins.	C.	3	3	0	0	1	3	2	1	0	2	0	18	32	20	30.0	0.0	0.0	10.0	10.0	30.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	10.7	1,200	3,000	
Elizabeth City	W.	2	4	5	3	8	3	7	4	1	4	4	7	52	145	4	9.6	12.0	7.2	19.2	7.2	16.8	9.6	2.4	9.6	9.6	16.8	10.4	18.1	5,000	8,000		
Dr. I. Fearing.	C.	9	11	6	5	9	6	9	12	5	8	4	93	145	27	44.0	24.0	20.0	36.0	96.0	24.0	36.0	4.8	0.0	20.0	32.0	16.0	38.1	0.0	3,000	4,800		
Fayetteville	W.	1	4	1	0	4	5	5	5	2	4	3	39	127	4	19.2	4.8	0.0	6.1	24.0	24.0	24.0	0.0	3.9	6.1	24.0	14.1	12.3	9.6	2.3	4,800	6,100	
Dr. A. S. Rose.	C.	2	6	10	12	8	16	5	9	6	5	4	88	127	10	31.3	62.2	62.2	61.7	83.3	42.6	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	2.3	2,300	4,800	
Goldsboro	W.	4	1	0	1	4	8	3	6	5	8	5	3	48	116	13	3.4	0.0	3.4	13.7	32.7	31.0	32.0	6.1	1.7	12.7	41.7	11.0	33.7	3.5	6,100	6,100	
Robert A. Creech, Esq., Health Officer.	C.	5	4	8	3	6	4	6	8	7	6	4	6																				
Greensboro	W.	9	5	11	11	5	11	13	11	5	7	11	10	109	266	17	5.8	21.6	19.8	9.8	21.6	25.6	21.6	6.9	9.8	13.8	21.6	19.7	7.9	25.3	6,100	10,100	
John S. Michaux, City Clerk.	C.	17	13	9	11	11	13	12	11	10	11	17	12	147	266	51	39.0	27.0	30.2	33.0	39.3	36.3	33.0	39.0	33.0	33.0	36.3	30.6	36.7	4.0	4,000	10,100	
Henderson	W.	3	1	5	2	0	2	3	1	2	2	3	35	63	42	17	5.7	28.6	11.4	0.0	11.4	41.7	1.5	6.2	11.4	22.8	17.1	13.3	4.6	6.6	2,100	3,800	
Dr. John H. Tucker.	C.	6	1	2	3	4	1	3	4	2	1	1	28	63	42	7.1	14.1	12.1	2.8	22.8	22.8	2.7	7.0	21.2	2.8	23.8	21.4	1.7	120.6	1,700	3,800		
Laurinburg	W.	1	1	0	1	1	1	3	0	5	1	1	16	32	40	13	13.3	0.0	13.3	13.3	13.3	3.3	4.0	0.0	6.6	7.3	13.3	13.7	8.2	900	1,500		
Dr. G. D. Everington.	C.	2	1	1	0	1	2	2	1	1	1	1	16	32	40	20.0	20.0	20.0	0.0	20.0	40.0	40.0	9.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	600	1,500	
Lexington	W.	0	1	0	1	1	2	2	0	1	0	3	11	14	0	15.0	0.0	0.0	15.0	30.0	30.0	0.0	0.0	15.0	0.0	15.0	0.0	0.0	0.0	0.0	800	1,300	
John H. Moyer, Esq., Mayor.	C.	0	0	0	1	0	2	0	0	0	0	3	3	0	0	0.0	0.0	0.0	24.0	0.0	0.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	800	1,300

TABLE IV—Continued.

Towns and Reporters.	Races.	Deaths by Months, 1904.												Death Rate (Annual) Per 1,000, by Months.								Rate for Year.	Population.				
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.												
Marion	W.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	800	1,200
Dr. B. L. Ashworth.	C.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	
Mouree	W.	2	0	1	2	1	0	1	0	1	2	1	1	13	13	0	0	0	0	0	0	0	0	0	0	1,850	2,450
Dr. John M. Blair.	C.	0	0	1	1	2	0	1	1	1	0	1	0	10	23	0	0	0	0	0	0	0	0	0	0	600	
Oxford	W.	0	0	1	3	2	1	4	0	2	2	4	19	49	0	0	0	0	0	0	0	0	0	0	0	1,250	2,450
Dr. S. D. Booth.	C.	6	5	1	1	0	4	1	0	2	1	4	30	57	6	48	0	0	0	0	0	0	0	0	0	1,200	
Raleigh	W.	6	7	0	6	14	11	18	11	15	13	15	4	130	256	18	10	5	15	0	0	0	0	0	0	8,000	13,800
T. P. Sale, Esq., Clk Bd. Health.	C.	0	0	0	0	0	0	0	0	0	0	0	0	18	18	6	14	4	18	6	14	5	522	5	5	5,800	
Reidsville	W.	3	2	2	4	0	2	2	1	3	3	3	27	76	46	1	55	4	73	8	18	5	282	8	21	2,900	4,200
R. S. Montgomery, Clerk.	C.	5	6	8	2	6	4	1	2	3	3	49	76	46	1	55	4	73	8	18	5	282	8	21	1,300		
Rocky Mount	W.	0	1	3	1	1	3	0	2	1	1	16	29	0	0	0	0	0	0	0	0	0	0	0	0	1,600	3,100
Dr. J. T. Shubrick.	C.	2	3	1	0	1	0	1	2	1	1	13	29	15	0	30	0	0	0	0	0	0	0	0	0	1,500	
Salem	W.	3	3	0	3	9	8	3	0	4	3	4	42	49	10	9	10	9	32	729	110	9	0	14	5	3,300	3,650
S. E. Butner, Supt. Health.	C.	2	1	0	1	0	1	0	1	0	1	7	68	68	6	34	3	0	0	0	0	0	0	0	0	350	
Salisbury	W.	4	6	9	10	16	6	8	9	6	5	3	82	128	12	3	19	5	27	7	18	5	15	4	9	3,900	6,400
Dr. H. T. Trantham.	C.	1	2	4	2	6	5	4	4	5	4	46	46	48	4	8	19	2	9	528	824	0	19	2	24	2,500	
Southport	W.	1	0	0	1	0	1	2	0	0	0	5	12	13	3	0	0	0	0	0	0	0	0	0	0	900	1,400
Dr. D. I. Watson.	C.	0	0	1	0	1	0	1	0	3	0	7	7	18	0	0	0	0	0	0	0	0	0	0	0	500	
Tarboro	W.	3	4	3	1	2	0	5	0	5	0	4	27	49	18	0	24	0	18	0	12	0	0	0	0	2,000	2,500
Dr. William J. Thigpen.	C.	1	6	2	1	2	1	0	4	1	1	22	24	0	0	0	0	0	0	0	0	0	0	0	0	500	
Wadesboro	W.	1	2	1	2	0	3	1	1	2	1	3	19	32	12	0	0	0	0	0	0	0	0	0	0	1,000	1,700
Dr. J. H. Bennett.	C.	0	1	1	3	1	2	0	1	1	2	10	13	0	0	17	1	17	151	417	134	3	0	24	0	700	

TABLE IV—Continued.

Towns and Reporters.	Races.	Deaths by Months—1904.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.												
		Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.	Grand Total.											
Washington Dr. D. T. Tayloe.	W. C.	4 5	3 4	5 7	5 5	5 13	5 6	5 8	5 3	5 3	5 5	5 6	116 67	16.0 20.7	12.0 16.5	16.0 24.0	32.0 720.0	20.0 753.8	20.0 824.8	20.0 833.1	20.0 12.4	20.0 42.0	20.0 723.1	8.0 12.4	0.0 42.0	4.0 72.0	16.3 19.7	3,000 2,900	9,900
Waynesville Dr. Thomas Stringfield, Mayor.	W. C.	1 0	2 0	0 0	0 0	2 0	0 0	0 0	1 0	1 0	1 1	1 2	13 12	7.5 0.0	15.0 0.0	15.0 0.0	0.0 0.0	0.0 0.0	15.0 0.0	7.5 0.0	15.0 0.0	7.5 0.0	15.0 0.0	7.5 0.0	6.9 0.0	6.5 0.0	1,600 400	2,000	
Weldon J. T. Gooch, Esq., Mayor.	W. C.	0 0	1 3	1 5	2 1	2 3	0 3	0 3	0 0	1 1	0 0	7 22	23 600	0.0 24.0	48.0 17.8	16.0 20.7	32.0 71.7	16.0 427.6	48.0 615.9	48.0 134.3	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	700 750	1,450	
Wilmington Dr. Charles T. Harper.	W. C.	20 25	16 32	19 41	16 22	23 36	23 28	16 37	24 32	21 37	15 23	15 34	227 373	24.0 27.3	17.8 38.4	20.7 49.2	71.7 26.4	427.6 30.0	615.9 39.3	134.3 40.0	0.0 43.4	0.0 23.4	0.0 92.7	0.0 125.1	0.0 133.9	0.0 28.6	10,000 11,000	21,000	
Wilson Dr. W. S. Anderson.	W. C.	3 4	4 6	2 7	4 5	3 7	6 9	5 13	2 3	3 5	5 7	4 69	116 14.5	10.3 14.5	13.7 21.8	13.7 7.3	8.1 28.4	13.7 18.2	9.4 22.0	11.1 28.8	18.9 36.0	9.5 32.0	15.8 12.0	8.1 12.0	12.4 23.0	17.1 93.5	3,800 3,000	6,900	
Winston Dr. J. L. Hanes.	W. C.	5 8	5 11	5 10	12 12	31 0	21 4	5 5	84 243	10.0 21.3	10.0 29.3	10.0 42.7	10.0 73.4	10.0 21.3	10.0 29.3	10.0 42.7	10.0 73.4	10.0 42.7	10.0 73.4	10.0 42.7	10.0 73.4	10.0 42.7	10.0 73.4	10.0 42.7	10.0 73.4	10.0 42.7	6,000 4,500	10,500	

TABLE V—SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1903.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.
	By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
Asheville	W.	8,000	9.3	12.9	3	2	0	0	0	0	7	11	3	0	4	30	2	0	0	0	75	168	16	11
	C.	5,000	18.6		4	0	0	0	0	0	10	20	6	8	5	30	5	1	4	93		12	15	
Charlotte	W.	11,000	15.3	17.7	4	0	1	2	3	0	13	11	6	8	2	14	5	0	0	0	168	333	57	21
	C.	7,200	21.5		6	0	2	2	0	0	20	10	4	2	4	12	85	5	0	1	155	61	24	
Durham	W.	8,000	19.0	22.6	5	0	0	3	2	0	15	16	7	15	1	19	64	3	1	1	152	294	52	3
	C.	5,000	28.4		4	0	0	0	1	0	13	20	3	17	0	7	73	4	0	0	142	55	4	
Edenton	W.	1,200	9.2	9.0	0	0	0	0	0	0	7	0	1	0	1	0	5	0	0	0	11	28	4	0
	C.	1,900	8.9		0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	17	3	3	
Fayetteville	W.	2,500	9.2	13.3	3	0	0	0	0	0	0	1	3	3	0	1	11	1	0	0	23	62	3	1
	C.	2,300	16.9		3	0	0	0	0	0	2	7	2	4	3	2	10	5	1	0	39	13	4	
Goldsboro	W.	3,500	10.0	18.2	1	0	0	0	0	0	5	14	2	3	1	5	20	0	0	0	35	111	14	5
	C.	2,600	29.2		0	0	1	0	0	0	1	2	3	7	1	39	0	0	0	1	76	11	24	
Greensboro	W.	6,100	13.4	22.3	9	0	0	1	0	1	4	6	5	1	0	9	43	3	0	0	82	225	34	5
	C.	4,000	35.7		6	0	1	0	1	0	11	24	8	12	4	8	62	5	1	0	143	49	18	
Henderson	W.	2,100	9.0	18.9	1	1	0	0	0	0	1	1	2	2	1	4	15	0	1	1	19	72	1	0
	C.	1,700	31.2		1	0	0	0	9	3	2	10	6	1	4	15	0	0	0	0	53	1	4	
Laurinburg	W.	900	20.0	18.0	2	0	0	0	0	0	2	3	3	3	1	1	1	2	0	0	18	27	4	0
	C.	600	15.0		0	0	0	0	0	0	0	5	0	0	0	1	3	0	0	0	9	0	0	
Lenoir	W.	1,200	12.5	12.0	5	0	0	0	0	0	2	0	0	0	0	2	3	1	0	0	15	18	0	0
	C.	1,300	10.0		0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	3	0	0	

TABLE V—Continued.

Towns.	Races.		Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.	By Races.	By Towns.																					
Lexington	W. 800 C. 500	1,300	7.5 2.0	5.4	1	0	0	0	0	0	0	0	1	1	0	0	0	0	3	0	0	0	6	7	0	0	0
Marion	W. 800 C. 400	1,200	27.5 12.5	22.5	3	0	0	0	0	0	1	0	0	2	0	4	0	0	7	4	2	0	22	27	1	0	0
Monroe	W. 1,850 C. 600	2,450	8.7 16.7	10.6	2	0	1	0	0	0	0	0	2	0	2	3	0	1	4	1	0	0	16	26	0	0	0
Oxford	W. 1,200 C. 1,250	2,450	6.7 19.2	13.1	0	0	0	0	0	0	1	0	0	2	9	3	0	0	1	2	0	0	8	32	1	0	0
Raleigh	W. 8,000 C. 5,800	13,800	14.9 23.6	18.5	6	0	0	0	0	0	1	0	4	23	7	10	1	9	50	5	1	2	119	256	17	8	0
Reidsville	W. 2,900 C. 1,300	4,200	13.8 36.9	20.9	2	0	1	1	3	0	0	5	3	9	8	2	1	0	5	18	0	0	40	88	19	5	0
Rocky Mount	W. 1,600 C. 1,500	3,100	12.5 7.3	10.0	1	0	0	0	0	0	0	0	0	2	3	1	0	5	8	0	0	0	20	31	1	1	0
Salem	W. 3,300 C. 350	3,650	14.8 31.4	16.4	0	2	0	0	0	0	0	0	4	4	1	4	0	5	29	0	0	0	49	60	17	5	0
Salisbury	W. 3,900 C. 2,500	6,400	15.6 13.8	16.9	3	2	0	0	0	0	0	1	12	6	2	2	0	11	18	4	0	0	61	108	14	5	0
Southport	W. 900 C. 500	1,400	14.4 16.0	15.0	0	0	0	0	0	0	1	0	0	1	3	1	0	1	5	0	0	0	13	21	1	1	0

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TABLE V—Continued.

Town.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Tarboro	W.	2,000	7.5	15.6	1	0	0	1	0	0	0	4	1	0	0	0	0	5	2	0	1	15	36	3	1
	C.	500	48.0		1	0	0	0	0	0	1	6	0	0	0	0	8	4	0	0	0	24	0	0	
Wadesboro	W.	1,000	13.0	14.7	0	0	0	0	0	0	2	0	0	2	1	2	6	0	0	0	0	13	25	2	0
	C.	700	17.1		0	0	0	0	0	0	1	1	0	3	1	3	3	0	0	0	0	12	0	0	
Washington	W.	3,000	14.3	15.6	5	0	0	0	0	0	4	2	4	1	3	6	16	2	0	0	0	43	10	0	0
	C.	2,900	16.9		3	0	1	0	1	0	3	3	3	6	1	9	18	1	0	0	0	49	7	0	0
Waynesville	W.	1,000	20.0	18.5	1	0	0	2	0	0	2	2	0	2	1	4	5	0	0	0	0	20	24	5	0
	C.	300	13.3		0	0	0	0	0	0	1	0	0	0	0	4	5	0	0	0	0	4	1	0	0
Weldon	W.	700	11.4	24.8	1	0	0	3	0	0	1	3	0	1	0	2	3	0	0	0	0	8	35	2	0
	C.	750	38.0		1	0	0	0	2	0	1	0	0	0	0	14	3	0	0	0	0	27	0	0	0
Wilmington	W.	10,000	21.2	26.2	5	0	12	3	1	0	16	17	10	23	19	25	68	8	5	1	213	550	60	4	
	C.	11,000	30.6		9	1	22	2	15	0	22	32	7	32	32	27	122	13	0	2	337	134	51	0	
Wilson	W.	3,800	10.3	13.5	1	0	1	1	0	0	4	13	8	2	1	2	19	1	0	1	39	92	12	3	
	C.	3,000	17.7		0	0	1	0	2	0	1	0	1	0	0	2	19	1	0	0	53	14	0	0	
Total, 27 towns	W.	91,250	14.3	18.3	63	7	15	17	12	4	99	127	85	95	36	135	546	45	11	6	1303	2841	348	80	
	C.	64,450	23.9		41	2	32	8	41	6	132	238	56	111	54	116	631	56	5	9	1538	478	156	0	
Grand total		155,700			104	9	47	25	53	10	231	865	141	206	90	251	1177	101	16	15	2841		826	236	

TABLE VI—SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1904.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.
	By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
Asheville	W. 8,000 C. 5,000	13,000	11.7 21.0	15.3	1	1	0	0	1	0	10	12	18	10	0	12	25	4	0	0	94	199	14	5
Charlotte	W. 11,000 C. 7,200	18,200	13.2 21.0	16.3	3	1	0	0	0	0	12	10	7	8	1	6	90	6	1	0	145	236	47	26
Durham	W. 8,000 C. 5,000	13,000	13.9 37.2	25.9	7	2	0	0	2	0	13	24	3	12	2	24	56	5	0	1	151	337	46	5
Edenton	W. 1,200 C. 1,800	3,000	11.7 10.0	10.7	0	0	0	1	0	0	0	1	1	0	0	1	10	0	0	0	14	32	2	0
Elizabeth City	W. 5,000 C. 3,000	8,000	10.4 31.0	18.7	2	0	2	1	0	0	3	9	5	10	2	9	14	1	1	0	52	145	14	5
Fayetteville	W. 2,500 C. 2,300	4,800	15.6 23.9	28.4	2	0	1	1	0	0	1	5	7	9	0	7	9	1	0	1	39	127	9	1
Goldsboro	W. 3,500 C. 2,600	6,100	13.7 26.1	19.1	2	0	1	3	0	0	2	6	5	2	0	6	16	1	0	1	48	116	14	6
Greensboro	W. 6,100 C. 4,000	10,100	17.9 36.7	25.3	4	0	2	1	0	0	17	15	5	5	0	9	43	8	0	0	109	256	29	9
Henderson	W. 2,100 C. 1,700	3,800	13.4 20.6	16.6	1	0	0	0	0	0	1	19	11	12	5	6	2	7	1	2	28	63	1	0
Laurinburg	W. 900 C. 600	1,500	17.8 26.7	21.3	2	0	0	0	0	0	1	3	1	4	1	0	8	0	0	0	16	32	1	2

TABLE VI—Continued.

Towns.	Races.		Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhæal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.
	Total		Total		By Races.	By Towns.																				
	By Races.	Total	By Races.	Total																						
Lexington	W. 800 C. 500	1,300	13.7 6.0	10.8	1	0	0	0	0	0	0	0	0	2	0	0	0	1	7	0	0	0	11	14	1	0
Marion	W. 800 C. 400	1,200	37.5 2.5	25.8	5	0	0	0	0	0	0	0	0	1	0	1	0	9	13	1	0	0	30	31	0	0
Monroe	W. 1,850 C. 600	2,450	7.0 16.7	9.4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	7	1	0	13	23	0	0
Oxford	W. 1,250 C. 1,200	2,450	15.2 25.0	20.0	1	0	0	0	1	0	0	0	0	2	4	1	3	0	6	4	0	0	19	49	8	1
Raleigh	W. 8,000 C. 5,800	13,800	16.2 21.7	18.5	1	0	0	0	0	1	0	0	5	13	19	8	0	20	60	2	0	1	130	256	29	7
Reidsville	W. 2,900 C. 1,300	4,200	9.3 37.7	18.1	2	0	0	0	0	1	0	0	4	8	3	10	1	10	57	8	1	1	126	32	9	9
Rocky Mount	W. 1,600 C. 1,500	3,100	10.0 8.7	9.3	0	0	0	0	0	0	0	1	1	1	3	3	1	2	4	0	0	0	16	29	3	1
Salem	W. 3,300 C. 350	3,650	12.7 20.0	13.4	0	0	0	0	1	0	0	0	3	4	1	2	0	6	22	2	1	0	42	49	12	2
Salisbury	W. 3,900 C. 2,500	6,400	21.0 18.4	20.0	7	0	0	0	0	0	0	0	9	10	6	5	1	23	18	3	0	0	82	128	18	2
Southport	W. 900 C. 500	1,400	5.5 14.0	8.6	0	1	0	1	0	1	0	0	0	0	0	2	0	0	1	0	0	0	6	12	0	0

TABLE VI—Continued.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Tarboro	W.	2,000	13.5	19.6	2	0	0	0	0	0	1	2	3	6	0	4	10	0	0	0	27	49	7	0	
	C.	500	44.0		0	0	0	0	0	0	1	6	3	2	0	1	7	2	0	2	22		7	2	
Wadesboro	W.	1,000	19.0	18.8	0	0	0	0	0	0	4	0	0	0	0	3	10	0	0	1	19	32	1	2	
	C.	700	18.6		0	0	0	0	0	0	2	1	0	0	2	1	6	0	0	1	13		0	3	
Washington	W.	3,000	16.3	19.7	4	0	5	1	0	0	4	4	8	4	4	5	6	7	1	0	0	49	116	5	0
	C.	2,900	23.1		3	2	0	0	0	0	5	13	2	6	5	12	17	2	0	0	67		9	0	
Waynesville	W.	1,600	6.9	6.5	1	0	0	0	0	0	2	4	0	3	0	1	0	0	0	0	11	13	2	0	
	C.	400	5.0		0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2		1	0	
Weldon	W.	700	10.0	20.0	0	0	0	0	0	0	1	0	0	1	0	2	4	0	0	0	7	29	4	1	
	C.	750	29.3		1	0	0	0	0	0	1	3	0	1	0	2	13	0	0	1	22		7	0	
Wilmington	W.	10,000	22.7	28.6	4	0	13	3	0	0	21	21	11	19	16	37	75	5	2	0	227	600	74	6	
	C.	11,000	33.9		7	1	33	0	1	1	21	36	11	34	32	39	142	10	2	3	373		141	41	
Wilson	W.	3,800	12.4	17.1	2	0	0	0	0	0	5	2	2	2	2	5	29	0	0	0	47	116	24	1	
	C.	3,000	23.0		2	0	5	0	0	0	4	9	3	3	0	10	30	2	0	1	69		30	0	
Winston	W.	6,000	12.3	23.1	4	4	0	0	4	1	4	12	11	5	1	12	17	9	0	0	84	243	34	9	
	C.	4,500	35.3		4	0	0	0	3	2	19	34	12	15	4	20	35	11	0	0	159		55	15	
Total, 28 towns	W.	101,700	15.2	20.0	54	9	24	19	7	2	126	153	127	119	35	218	576	51	6	6	1542	3468	404	99	
	C.	71,600	26.9		68	6	54	7	10	9	181	305	77	153	64	194	714	67	5	5	121926		514	206	
Grand total		173,300			122	15	78	26	17	11	307	468	204	272	99	412	1290	118	11	18	3468		918	305	

REPORT OF TREASURER FOR THE TWO YEARS ENDING DECEMBER 31, 1904.

EXPENDITURES.

1903.	
Jan.	1. Amount due Treasurer from last report.....\$ 88.91
	27. The News and Observer Publishing Company, for Year Books of 1901, 1902, 1903..... 3.50
Feb.	4. Salary of Secretary and Treasurer for January.. 83.33
	7. Dr. Richard H. Lewis, expenses as delegate to Plague Conference at Washington, January 19. 34.15
	10. Western Union Telegraph Company, telegrams in January 1.39
	10. C. T. Bailey, Postmaster, postage on BULLETIN... .60
	10. Stamps 15.00
	11. Improved Mailing Case Co., mailing tubes for water samples 7.20
March	1. Salary of Secretary and Treasurer for February, 83.33
	19. Secretary of State, copy of Bill to Define the Practice of Medicine and Surgery..... 1.30
	31. <i>The Sanitarian</i> , subscription for nine copies for Board of Health for 1903..... 28.00
April	4. Salary of Secretary and Treasurer for March.... 83.34
	4. Office rent, first quarter..... 15.00
	6. Stamps 15.00
	9. Western Union Telegraph Co., telegrams for February and March 1.66
	22. Funk & Wagnalls Co., one copy "Prevention of Disease" 5.00
	28. Stamps 10.00
May	1. Salary of Secretary and Treasurer for April.... 83.33
	22. James A. Egan, M. D., treasurer, annual dues 1902-1903 conference of State and Provincial Boards of Health of North America..... 10.08
June	6. Dr. Richard H. Lewis, expenses to annual meet- ing at Hot Springs..... 28.65
	6. Salary of Secretary and Treasurer for May.... 83.33
	12. Dr. George G. Thomas, <i>per diem</i> and expenses, annual meeting at Hot Springs..... 30.65
	23. Dr. W. P. Ivey, <i>per diem</i> and expenses, annual meeting at Hot Springs..... 24.85
	23. Dr. J. L. Nicholson, <i>per diem</i> and expenses, annual meeting at Hot Springs..... 54.00

1903.

July	6. Salary of Secretary and Treasurer for June.....\$	83.33
	6. Office rent, second quarter.....	15.00
	7. Stamps for Biological Laboratory.....	7.50
	21. P. H. Andrews, Post-office Financial Clerk, to secure payment in advance of postage on BUL- LETIN	5.00
	30. Thomas Whittaker, 1 copy Rosenau's "Disinfection and Disinfectants".....	2.18
Aug.	1. Stamps	10.00
	3. Salary of Secretary and Treasurer for July....	83.33
	4. Western Union Telegraph Co., telegrams for April, May, June and July.....	2.20
	5. A. Williams & Co., sundry supplies.....	1.90
Sept.	1. Salary of Secretary and Treasurer for August...	83.33
	3. Western Union Telegraph Co., account for August	.25
Oct.	5. Salary of Secretary and Treasurer for September,	83.34
	5. Office rent, third quarter.....	15.00
Nov.	5. Salary of Secretary and Treasurer for October..	83.34
	5. Pencils25
	9. Gatchel & Manning, 1 half-tone cut of hook-worm patient for September BULLETIN.....	2.55
	10. Dr. Richard H. Lewis, expenses to American Pub- lic Health Association at Washington.....	46.00
	25. Dr. S. Westray Battle, <i>per diem</i> and expenses, annual meeting at Hot Springs, and expenses to American Public Health Association at Wash- ington	90.15
Dec.	1. Salary of Secretary and Treasurer for November,	83.33
	11. Dr. Francis Duffy, <i>per diem</i> and expenses, annual meeting at Hot Springs.....	46.10
	19. Stamps	10.00
	31. Salary of Secretary and Treasurer for December,	83.34
	31. Office rent, fourth quarter.....	15.00
	Drayage on BULLETIN to post-office 12 months at 15 cents	1.80

1904.

Jan.	7. C. T. Bailey, postmaster, deposit to secure pay- ment in advance of postage on BULLETIN.....	5.00
	15. The News and Observer Publishing Company, 1 copy <i>N. C. Year-Book and Business Directory</i> ..	2.00
	15. <i>The Sanitarian</i> , 9 copies, 1904, for the members of the Board of Health.....	28.00
	19. E. M. Uzzell & Co., 500 postal cards for printed reminders to the County Superintendents of Health	5.00
	21. Stamps for biennial report.....	15.00

1904.

Jan.	21.	Dr. George G. Thomas, <i>per diem</i> and expenses, inspection of Morganton institutions.....	\$ 19.88
Feb.	3.	Salary of Secretary and Treasurer for January..	83.33
	8.	Southern Express Co., charges on packages of reports to 8 members of the Board of Health..	2.00
March	2.	Salary of Secretary and Treasurer for February,	83.33
	4.	Western Union Telegraph Co., telegrams in February60
	19.	Stamps	15.00
April	1.	Salary of Secretary and Treasurer for March...	83.33
	1.	Office rent, first quarter.....	15.00
	14.	Biological Laboratory, to return money paid out of its fund for cuts for BULLETIN.....	3.35
	16.	The Maurice Joyce Engraving Co., 1 cut for BULLETIN	1.04
	27.	Stamps	15.00
May	2.	Salary of Secretary and Treasurer for April....	83.33
	9.	Gatchel & Manning, 1 full-page cut for malaria article	11.50
	9.	Dr. James A. Egan, Treasurer, annual dues to National Conference of State and Provincial Boards of Health.....	10.00
	13.	Western Union Telegraph Co., telegrams in March	1.30
	14.	Dr. Richard H. Lewis, expenses, inspection of State institutions at Morganton and Chapel Hill; and Durham (smallpox conference).....	22.80
June	6.	Salary of Secretary and Treasurer for May.....	83.33
	6.	Dr. Richard H. Lewis, expenses to annual conference with Surgeon-General U. S. Public Health and Marine Hospital Service at Washington, D. C	24.00
	7.	Dr. W. P. Ivey, <i>per diem</i> and expenses, annual meeting at Raleigh.....	33.00
	7.	Dr. W. S. Rankin, expenses, hook-worm investigation in December, 1903.....	28.36
		Western Union Telegraph Co., telegram in May..	.25
	13.	C. T. Bailey, postmaster, deposit to secure payment of postage on BULLETIN.....	5.00
		Balance due C. T. Bailey, for postage, to 1st of June.21
	13.	Dr. Henry W. Lewis, <i>per diem</i> and expenses, annual meeting at Raleigh.....	27.05
July	2.	Salary of Secretary and Treasurer for June....	83.33
	2.	Office rent, second quarter.....	15.00
	7.	Western Union Telegraph Co., telegrams in June,	1.66
	7.	E. M. Uzzell, 500 printed postal cards.....	5.00

1904.

July	11. Southern Railway Co., freight.....\$	1.01
	11. Drayage15
	13. Dr. Francis Duffy, <i>per diem</i> and expenses, annual meeting at Raleigh.....	29.15
	13. S. H. Wiley, 1 Foyer Cylinder Letter Press.....	24.91
	15. Thomas H. Briggs & Sons, 1 Duplicator.....	6.35
	16. Stamps	20.00
	20. Subscription to Journal of Public Health.....	1.03
Aug.	1. Miss Mabel P. Massey, services as stenographer and typewriter, July.....	5.00
	3. Salary of Secretary and Treasurer for July....	83.34
	4. A. Williams & Co., sundries for office to 1st inst..	4.25
	8. Western Union Telegraph Co., telegrams in July,	.68
Sept.	1. Salary of Secretary and Treasurer for August..	83.33
	3. Miss Mabel P. Massey, stenographic work, August	5.00
	13. T. A. Sills, clerk superior court, fee for list of physicians	1.00
	14. P. Blakiston's Son & Co., 1 copy "Examination of Waters and Water Supplies".....	4.00
	15. C. T. Bailey, postmaster, stamps for consumption pamphlet	20.00
	24. Stamps for consumption pamphlet.....	20.00
	30. W. H. Brewer, repairs to typewriter.....	1.00
	30. Dr. George M. Sternberg, Treasurer, annual dues, The National Association for the Study and Prevention of Tuberculosis.....	5.00
	1. Miss Mabel P. Massey, services as stenographer, September	15.00
	3. C. T. Bailey, postmaster, stamps for consumption pamphlet	50.00
Oct.	6. Western Union Telegraph Co., telegrams in September	1.46
	6. Salary of Secretary and Treasurer for September,	83.33
	6. Office rent, third quarter.....	15.00
	22. Stamps	10.00
	26. Fees, C. S. C.'s, for lists of physicians.....	1.75
	4. Salary of Secretary and Treasurer for October..	83.33
Nov.	4. Miss Mabel P. Massey, stenographic and clerical work in October.....	21.00
	8. A. Williams & Co., sundry office supplies.....	2.50
	15. C. T. Bailey, postmaster, stamps for consumption pamphlets	50.00
	16. S. H. Wiley, 4 rolls paper for Foyer Press.....	2.81
	S. H. Wiley, 1 typewriter ribbon.....	1.00

1904.

Dec.	1. Dr. George G. Thomas, expenses and <i>per diem</i> for inspection of State institutions at Raleigh, Oxford and Chapel Hill.....	\$ 29.30
	1. Dr. Richard H. Lewis, expenses for inspection of State institutions at Raleigh, Oxford and Chapel Hill	15.40
	1. W. P. Ivey, M. D., <i>per diem</i> and expenses for inspection of Wilkes County convict camp.....	31.20
	1. C. T. Bailey, deposit to secure payment of postage on BULLETIN	5.00
	3. Salary of Secretary and Treasurer for November,	83.34
	3. Miss Mabel P. Massey, stenographic services in November	15.00
	7. Western Union Telegraph Co., telegrams in November50
26.	Dr. Richard H. Lewis, expenses, inspection of State institutions, Greensboro.....	12.35
31.	Salary of Secretary and Treasurer for December,	83.35
31.	Office rent, 4th quarter.....	15.00
31.	Miss M. P. Massey, services as stenographer in December	15.00
31.	Stamps for consumption pamphlets.....	50.00
31.	Dr. J. L. Nicholson, <i>per diem</i> and expenses, inspection of Eastern Hospital.....	16.00
31.	Drayage on BULLETIN to post-office 12 months at 15 cents	1.80
	Balance on hand.....	526.58
		<hr/> \$4,000.00

RECEIPTS.

Appropriation for 1903.....	2,000.00
Appropriation for 1904.....	2,000.00
	<hr/> \$4,000.00

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